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## CHAPTER 2 – PROPOSED ACTION AND ALTERNATIVES

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### 2.1 INTRODUCTION

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This chapter discusses alternative-driving issues and lists other issues that were analyzed, but did not warrant the development of separate alternatives. It describes and compares the alternatives considered in detail and briefly discusses other alternatives that were considered, but eliminated from further study. The desired condition, purpose and need statements, and management area objectives in conjunction with the issues outlined in this chapter, provide the framework for alternative development.

Changes made to the document between the Draft and the Final Environmental Impact Statement (EIS) include additional information in the Proposed Action to clarify criteria for noxious weed treatment, increase detail in descriptions for herbicide application, increased detail on prescriptions for tree removal and retention, and increased description on Alternative 3 to further illustrate the similarity and difference with the Proposed Action, based on questions raised in public comment.

### 2.2 PUBLIC INVOLVEMENT

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Notice of the proposal was initiated by the Eldorado National Forest Quarterly Schedule of Proposed Actions in April, 2006. On March 11, 2009 the Notice of Intent (NOI) was published in the Federal Register. A more detailed scoping letter outlining general existing conditions, proposed treatments, and acres planned for treatment was mailed on January 20<sup>th</sup> 2009 to 37 individuals, organizations, and government entities on the District's contact list who had expressed interest in this or similar projects. The public was asked to provide comments on the project.

Comments submitted during scoping were reviewed to identify issues raised by the public. An issue is defined as a point of disagreement, debate, or dispute with a proposed action based on some anticipated effect. Significant issues are identified as those issues that are not outside the scope of the proposed action, already decided by law or policy, irrelevant to the decision or not supported by scientific or factual

evidence. Significant issues were used to develop alternatives to the Proposed Action.

Scoping comments were submitted by Dick Artley as opposing science on environmental impacts of activities and rational for the Purpose and Need, and the Proposed Action.

Comments were submitted on behalf of John Muir Project with concerns for impacts on wildlife resulting from implementation of the Proposed Action, requests for additional information and analysis, requests for alternatives to be analyzed, and presenting opposing science on rational for the Purpose and Need and development of the Proposed Action.

Comments were submitted on behalf of Sierra Forest Legacy, the Plumas Project, and the Sierra Club, (collectively the "Forest Legacy") with concerns for impacts on wildlife resulting from implementation of the Proposed Action, requests for additional information and analysis, requests for alternatives to be analyzed, and presenting opposing science on rational for the Purpose and Need and development of the Proposed Action.

A Comment was submitted on behalf of the California Forestry Association in support of the Proposed Action.

Comments were submitted on behalf of Mason, Bruce, and Girard, Inc in support of the Proposed Action and identifying concerns with potential impacts of prescribed burning on air quality and risk to neighboring landowners.

Meetings, trips to the area, e-mails, and telephone calls were conducted with Sierra Forest Legacy to discuss treatment prescriptions and implementation of PNW-GTR-220 within treatment units. Meetings were held with a representative from Mason, Bruce and Girard, INC. to discuss multiple ownership strategy for the Area. Meetings were also conducted that presented the project to the Eldorado Interpretive Association and the industry monitoring group.

The Environmental Protection Agency;  
Environmental Impact Statements; Notice of

Availability for the Big Grizzly Draft EIS was published in the Federal Register February 5, 2010. The Draft EIS was sent to 29 individuals and/or groups and 11 agencies. The Draft EIS was available for public review and comment from February 5, 2010 to March 22, 2010. During the comment period the Forest Service received comments from 8 individual groups.

Comments were submitted on behalf of Californians for Alternatives to Toxins with concerns relative to project impacts that would occur due to pesticide use, identifying insufficient information relative to proposed activities, and requesting additional analysis and review of opposing science.

Comments were submitted on behalf of John Muir Project with concerns relative to project impacts on wildlife, requesting additional information and analysis, and identifying insufficient information in the Draft EIS.

Comments were submitted on behalf of Sierra Forest Legacy, with concerns for impacts on wildlife resulting from implementation of the Proposed Action, requests for additional information and analysis, identifying insufficient information in the Draft EIS and requesting additional alternatives to be analyzed. A follow-up meeting was held with the Director of Sierra Forest Legacy to further clarify issues and points of concern.

Comments were submitted on behalf of Mason, Bruce, and Girard, Inc and Sierra Pacific Industries in support of the Proposed Action. In expressing support for the project, concerns were also raised that the proposed removal of material was very conservative in the Proposed Action.

Comments were submitted by the United States Department of Interior requesting corrections and identifying insufficient information in the Draft EIS specific to the Pacific fisher and California red-legged frog.

Comments were submitted by the United States Fish and Wildlife Service requesting further information on public involvement and issues related to Environmental Justice.

Comments were submitted from the Environmental Protection Agency identifying areas of insufficient information in the Draft EIS. The Final EIS was

updated and analysis was expanded based on comments received on the Draft EIS. Two additional alternatives were developed based on comments received during the comment period.

Responses to comments received on the DEIS are included in Appendix E of this document. The Big Grizzly project file contains the public letters, records of phone calls and visits to the area, mailing lists, and other documentation of the outreach and discussions held with members of the public.

## 2.3 SIGNIFICANT ISSUES

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This section describes the significant issues identified during the public involvement process that were used to formulate alternatives and to meet the Purpose and Need. The issues discussed in this chapter were used to develop the action alternatives.

1. Negative effects to wildlife and forest users could result from exposure of forest users and wildlife to glyphosate due to inert ingredients contained in the products and the ability of the pesticide to cause genetic damage (Artley).
2. Commercial logging and the use of heavy equipment has the potential to damage aquatic resources, negatively affect organisms, reduce hydrologic functioning, reduce mineral and nutrient cycling, increase water temperature, reduce organic matter content in streams, cause soil compaction and increase erosion (Artley).
3. Unnecessary and avoidable habitat degradation such as removal of trees to 30 inches has the potential to increase fragmentation and reduce habitat within the project area which could threaten viability of owl and other sensitive species, especially in units that provide higher quality habitat (JMP, SFL).
4. An Alternative based on GTR 220 by North et. al (2009) was requested during Scoping Comments. This Alternative would meet all elements of the Purpose and Need. The Proposed Action is consistent for activities that would occur in the proposed treatment units; therefore GTR-220 is not analyzed in detail as a separate alternative. A discussion on the consistency of the Proposed Action with North et al. (2009) is provided in Appendix D.

## 2.4 ALTERNATIVES CONSIDERED IN DETAIL

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Based on significant issues, the following alternatives were analyzed in detail.

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### 2.4-A – ALTERNATIVE 1 (PROPOSED ACTION)

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To move stands toward the Desired Future Condition for the land allocation described in the Final Supplemental Environmental Impact Statement (FSEIS) for the Sierra Nevada Forest Plan Amendment dated 1/21/2004, the Proposed Action includes a combination of fuels reduction and forest health improvement actions. Silvicultural treatments for each stand were chosen for their ability to meet the stated Purpose and Need. The focus of each treatment is based on the desired condition of each treatment area after management rather than the quantity or quality of the products removed from each area. Some proposed treatments would not commercially t h e

woody plants. In the 6 units proposed for both Triclopyr and Glyphosate application, Glyphosate may be utilized as a secondary treatment if initial treatment with Triclopyr reduces brush chinquapin sufficiently that brush cover objectives could be met by reducing other brush species only.

Follow-up treatment of herbicides would occur 1-5 years after the initial treatment of herbicide in three situations.

- Where plants targeted in the initial herbicide treatment are difficult to control and may need follow-up treatment to achieve adequate results (less than 30% cover of brush for at least 10 years for natural brush species and 0% for noxious weeds); In the six treatment units proposed for both glyphosate and triclopyr, glyphosate may be used in follow-up treatments if initial treatment with triclopyr reduces brush chinquapin sufficiently that brush cover objectives could be met by reducing other brush species only.
- Where plants targeted in the initial treatment may be readily controlled, but their seeds would rapidly re-establish in the newly opened growing space (this applies to both mastication and brush cutting areas, and to noxious weeds in units 318-17 and 329-15); and
- Where plants targeted in the initial treatment may be readily controlled, but grasses or forbs would rapidly re-establish in newly opened growing space and threaten survival of planted seedlings in gaps.

Prescribed burning as the only treatment is proposed on approximately 660 acres of the project area to facilitate burning of thinning units, and to reduce fuel loading between thinning units.

Less than 1 mile of road construction and approximately 57 miles of road reconstruction/maintenance is estimated to be necessary to facilitate accessibility to perform proposed fuel and forest health treatments and improve road condition within the project area.

Rehabilitation work would attempt to add complexity to the aquatic habitat and encourage riparian vegetation growth through the placement of large down wood, large rootwads and/or large boulders on Big Grizzly Creek (NE 1/4 of Section 22) where down cutting has created a ravine approx. 5 feet deep and 10 feet across for about 250 feet.

Detailed maps showing locations of the proposed units, and tables showing acreage and prescription by treatment unit are included in Appendix A.

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#### 2.4-B – ALTERNATIVE 2 (NO ACTION)

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The No Action alternative provides a means for evaluating the current ecosystem conditions as a baseline. It can also be used to compare the projected effects of each management alternative. The No Action can be used to look at the differences that would take place under the other alternatives, as well as the consequences of deferring activities if this alternative is selected.

It is important to keep in mind that “No Action” does not mean that there would be no further action in the project area. The current level of management would continue. Activities such as fire suppression, projects analyzed in earlier environmental analysis and decisions, and routine road and trail maintenance would continue. A list of Reasonably Foreseeable Activities, which would not be affected by this EIS and subsequent Record of Decision, is included in Chapter 3. Selection of this alternative would defer all the proposed treatment activities at this time.

Under the No Action Alternative, none of the proposed silvicultural treatments, prescribed burning, road improvements or watershed improvement activities would be implemented with this project. No action would be taken at this time to restore vegetation composition and structure, improve wildlife habitat, or maintain hydrologic function and improve the aquatic resources.

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#### 2.4-C – ALTERNATIVE 3

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This alternative was developed based on scoping comments that negative effects to wildlife and forest users could result from exposure of forest users and wildlife to herbicide use. Rather than using herbicide as a follow-up treatment, with Alternative 3 additional mastication entries would occur on 22 acres of pre-existing plantations, in 6 group selection areas ranging from 3-6 acres in size within unit 320-43, 946 acres of 15-30 year old plantations, and 75 acres of 47 year old plantation in order to reduce brush competition for a longer period of time than the initial treatment alone. The approximately 80

acres of gaps proposed for planting would have follow-up release for survival using hand release treatments with this alternative.

Twenty nine-acres proposed for treatment with herbicide as the initial treatment would be deleted from the project with Alternative 3. Treatment of identified scotch broom in unit 318-17, and follow-up treatments of scotch broom in units 318-17 and 329-15 with herbicide if hand treatments are not feasible or successful would not be included in this alternative .

Proposed treatments would remain unchanged from the Proposed Action on the approximately 3,100 acres proposed for understory thinning, the 890 additional acres proposed for stand improvement cutting including the creation of gaps of up to 3 acres over 10% of these acres and planting of gaps, 107 acres of precommercial thinning and mastication in <50-year old plantations, 22 acres initial treatment with mastication treatment on pre-existing plantation in 6 group selections within unit 320-43, and 946 acres of initial mastication or brush cutting and precommercial thinning in 15-30 year old plantations.

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#### 2.4-D – ALTERNATIVE 4

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This alternative was developed based on scoping comments that habitat degradation such as removal of trees to 30 inches has the potential to increase fragmentation and reduce habitat within the project area, which could threaten viability of California spotted owl and other sensitive species, especially in units that provide higher quality habitat.

Compared to Alternative 1, this alternative deletes commercial thinning on approximately 820 acres of identified high quality habitat within certain units or portions of units. Compared to Alternative 1, this alternative reduces the amount of treatment within specific California spotted owl Home Range Core Areas (HRCA). Additionally, 93 acres of prescribed burn only units proposed to facilitate burning in understory thinning units under Alternative 1 would be deleted with this alternative. In formulating this alternative, reductions in treatments were weighed with landscape position and efforts to maintain landscape effectiveness of fuels treatments.

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#### 2.4-E – ALTERNATIVE 5 (NON-COMMERCIAL ALTERNATIVE)

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Under this Alternative, treatment units proposed would remain the same as the Proposed Action; however, units proposed for commercial thinning in Alternative 5 would have only material necessary to meet fuels objectives removed. In general, this would result in a 12-inch maximum diameter limit for removal; however, in order to facilitate equipment access to treat the units effectively, there may be circumstances where larger than 12 inch trees are removed. This would include removal of trees for landings, skid roads and in order to access some denser areas of stands with mechanical harvest equipment. Additionally, no gap expansion and no planting with follow-up release treatments would occur in stand improvement units. Although a 12"DBH limit Alternative was found to not meet the entire Purpose and Need for the Big Grizzly Project, as a result of the November 3 2009 Order from the United States District Court, Eastern District of California from Case 2:05-cv-00205-MCE-GGH to include a non-commercial funding alternative at the Project Level for the Sierra Nevada Forests Fuel Reduction Projects, the effects of this alternative are analyzed in detail.

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#### 2.4-F – MODIFIED ALTERNATIVE 1

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This Alternative was developed to attempt to balance the need for treatments to modify fire behavior on the landscape and within the treatment areas, and the short term risk of effects to late seral species such as the California spotted owl. Modified Alternative 1 proposes treatment on 5357 acres within treatment units identified in Alternative 1. Modified Alternative 1 was developed using Alternative 1 and Alternative 4 as starting points because Alternative 1 provided the highest level of treatment effectiveness of the action alternatives while Alternative 4 provided lower risk to late seral habitat as a direct result of harvesting. The focus of Modified Alternative 1 is to implement a diversity of treatments to modify fire behavior on the landscape, while reducing environmental impacts to late seral habitat by reducing treatment intensity on HRCA habitat removed from treatment in Alternative 4.

Compared to Alternative 1, Modified Alternative 1 would reduce diameter limits and/or proposed

removal of trees on 384 acres of Thinning From Below units; change 60 acres of proposed thinning from below to Prescribed Fire Only units to facilitate burning of Thin from Below units; reduce thinning from below treatments on 374 acres by removing entire treatment units and portions of treatment units not critical to affect wildfire movement within the project area; and reduce prescribe burning on 78

acres of Prescribe Burn Only units associated with Thin from Below units. Other proposed treatments within identified units would be implemented the same as described in Alternative 1.

Reconstruction of roads would be reduced by 4.38 miles for the 4N19 road and 5 miles of the 14N21 road.

TABLE 3 CHANGES IN UNIT PRESCRIPTIONS AND ACRES WITH MODIFIED ALTERNATIVE 1

<b>Thin from Below Units with Reduced DBH and Removals</b>		
<b>Unit number</b>	<b>Acres</b>	<b>Prescription</b>
317-44	43	16 inch dbh limit pine, 20 inch dbh limit white fir and cedar unless large homogenous patches exist, then 20-30 inch white fir and cedar may be removed if they are in the intermediate or overtopped crown position, not wildlife trees per the wildlife guide and not in identified retention areas. All other elements of the design criteria would be the same.
317-47	41	16 inch dbh limit pine, 20 inch dbh limit white fir and cedar unless large homogenous patches exist, then 20-30 inch white fir and cedar may be removed if they are in the intermediate or overtopped crown position, not wildlife trees per the wildlife guide and not in identified retention areas. All other elements of the design criteria would be the same.
317-57	77	16 inch dbh limit pine, 20 inch dbh limit white fir and cedar unless large homogenous patches exist, then 20-30 inch white fir and cedar may be removed if they are in the intermediate or overtopped crown position, not wildlife trees per the wildlife guide and not in identified retention areas. All other elements of the design criteria would be the same.
317-59	17	16 inch dbh limit pine, 20 inch dbh limit white fir and cedar unless large homogenous patches exist, then 20-30 inch white fir and cedar may be removed if they are in the intermediate or overtopped crown position, not wildlife trees per the wildlife guide and not in identified retention areas. All other elements of the design criteria would be the same.
318-5	52	16 inch dbh limit all species
319-20	44	16 inch dbh limit all species
319-21	35	16 inch dbh limit all species
319-23	75	16 inch dbh limit all species
<b>Total Acres</b>	<b>384</b>	
<b>Acres of Thin from Below Units Reduced and Removed from Proposal</b>		
<b>Unit</b>	<b>Acres Removed from Proposal</b>	
318-4	51	
319-10	54	
319-13	75	
319-15	48	
319-19	8	
320-72	24	
320-78	76	
326-20	21	
326-24	41	
330-16	6	
330-18	30	
<b>Total Acres</b>	<b>434</b>	



Acres of Prescribe Burn Only Units Reduced and Removed from Proposal	
Unit	Acres Removed from Proposal
317-62	73
326-29	5
<b>Total Acres</b>	<b>78</b>
Acres of Prescribe Burn Only Units Increased to Facilitate Burning of Thin From Below Units	
Unit	Acres switched from thinning to Prescribe Burning
319-25	48
319-26	12
<b>Total Acres</b>	<b>60</b>

## 2.5 COMMON FEATURES AND REQUIRED DESIGN CRITERIA FOR ALL ACTION ALTERNATIVES

The following specific criteria would be applied during implementation of any action alternative or other activities associated with this project. The purpose of these measures is to avoid, or to minimize the potential for adverse effects to the resources discussed below.

Best Management Practices” (BMPs) as defined by the State of California for water quality protection (Water Quality Management for National Forest System Lands in California – Best Management Practices. Pacific Southwest Region, Vallejo, California) identified in section 12.1 Timber Management, 12.2 Road Building, 12.5 Vegetation Management, 12.6 Fuels Management, and 12.7 Watershed Management would apply. Specific BMP’s proposed for adoption in this project are discussed in Appendix B

### *Logging Systems / Biomass*

Commercial thinning from below and biomass removal using ground based whole tree and cut-to-length logging systems would mainly occur on slopes less than 35%. The selection of whole tree or cut-to-length systems would be determined by factors such as the availability of landings within the harvest units. Commercial timber removed from this project would be scaled or weighed for payment purposes. The prescription for tree removal is contained in the Marking Guidelines in the project file.

In whole tree harvest areas, conifer trees greater than 6” dbh would be cut and removed to landings during harvest operations along with the associated tops and limbs. In cut-to-length units, the stem material from

trees greater than 6” dbh would be removed to landings. In all units, existing and operation generated slash and brush would be tractor piled or masticated after harvest operations.

Biomass stored on landings could be disposed of in a number of ways, including on-site burning, commercial and personal use firewood, or as co-generation fuel.

The project administrator would designate skid trail systems in each unit. Existing skid trails and landings would be used if appropriate, to limit the extent of new areas of compacted ground within the project area. Temporary roads and up to 10-15% of landings and skid roads leaving landing used in this project would be contour ripped or subsoiled to alleviate soil compaction to the depth of the compaction and erosion problems, restore infiltration, and discourage unauthorized OHV use where landings and skid trails are where located on shallow soils, on slopes greater than 10% expected to channel water except lahar soils. These areas would be identified by the Sales Administrator during implementation and would be prioritized in units with pre-activity soil disturbance exceeding Forest Plan threshold values as identified by the Forest soil scientist. These areas would be tracked through the official contract record.

In whole tree logging units, one-end suspension of all logs and biomass would occur during skidding operations in order to reduce ground disturbance. In units selected for cut-to-length operations, complete suspension of all products would occur during yarding operation.

Landing size ~~tracked~~ to the project the Temporary

created during burning would be retained in areas that do not currently meet LRMP guidelines for snags or down logs.

Tractor piling would be precluded on slopes greater than approximately 35%, and tractor piling would be precluded from sensitive areas, such as archaeological sites, sensitive plant zones and perennial streamcourse buffer zones or inner-gorge areas. Down logs greater than 16 inches in diameter would be left to the extent practical.

Mastication may be substituted for tractor piling where surface fuels can be more effectively treated by this method.

Canopy closure and basal area would be retained and measured at the stand level and would be consistent with the 2004 SNFPA ROD Standards and Guidelines for Mechanical Thinning Treatments (pp 50-51).

Standing dead trees (snags) over 15 inches in dbh that do not present a hazard for woods worker and public safety would be retained within the units. Snags under 15-inches dbh, and meeting treatment criteria would be cut and removed.

Enhancement of individual black oak trees and groups of black oak trees would occur through selective removal of over-topping or encroaching conifers.

Hardwoods greater than 4 inches diameter would be retained except where removal is needed for equipment operability.

A clumpy distribution of residual trees rather than equal spacing of retained trees would result in some areas will be left thinner and some heavier depending on the current structure, species distribution and health of trees. Trees within a stratum (i.e., canopy layers or age cohorts) would be clumped, but different strata, for fuels reasons, would be spatially separated. Particular attention would be given to providing horizontal heterogeneity to promote diverse habitat conditions. A large proportion of the growing space would be allocated to the largest tree stratum. Drainage bottoms, flat slopes, and northeast facing slopes generally have higher site capacity and thus treatments would retain greater tree densities. Within stands, important topographic features may include concave sinks, cold air drainages, and moist microsites.

Some openings less than 1 acre in size within treatment units created with the intention of providing opportunities for pine regeneration would be scarified if a good pine seed year is observed during the life of the project. Scarification would be performed using tractors equipped with brush rakes.

### ***Safety and Health***

The removal of dead and unstable live trees (hazard trees) for woods worker and public safety would occur along timber haul roads and landings.

### ***Reduction of Annosus Establishment and Spread***

Outside of plantations, all freshly cut stumps of relevant conifer species greater than 14 inches dbh would be treated with an application of a registered borax fungicide (Sporax or equivalent) at an application rate of approximately 1 pound per acre in accordance with direction in FSH 3409.11 and recommendation from Region 5 Forest Health Protection, Southern Shared Service Area.

### ***Scenic Viewshed***

Where practicable, large piles of biomass would be located out of the immediate view of Eleven Pines Road.

Prescribed burn prescriptions would be designed to minimize the visual impact to the Rubicon River and Eleven Pines Road viewsheds.

### ***Prescribed Fire***

Post-harvest machine piling and burning of existing and operations slash would occur as necessary to reduce surface fuels in preparation for the reintroduction of prescribed fire. Pile burning would be conducted by Forest Service crews and would occur the first fall following piling in which burn prescriptions are met. Fire would be allowed to creep between piles during burning.

Post-harvest understory prescribed burning is planned for the majority of the acres that are thinned with this project.

In preparation for prescribed fire, perimeter line construction would be needed where roads, trails, or natural barriers are absent. This may involve cutting of vegetation including trees up to 6-inch diameter,



pruning, and hand scraping a bare soil line, or where consistent with other design criteria, line construction with a D-6 or smaller dozer.

All fire lines would follow the established guidelines for water bar construction as outlined in the Best Management Practices. Upon completion of burning, fire lines would be disguised by spreading pine needles, brush, etc where they intersect roads or trails in order to reduce the likelihood of the firelines becoming unwanted trails.

Prescribed burn prescriptions would meet LRMP standards and guidelines.

All burning activities would adhere to pertinent air quality regulations. Smoke emissions would be minimized by following Best Available Control Measures (BACM). A smoke permit administered by the local County Air Resource Agency would accompany burn plans. For this project the Placer County Air Pollution Control District would issue the permit. To reduce effects of prescribed burns on air quality, smoke control and monitoring measures would be identified in the Smoke Management Plan that would be prepared prior to burning.

The Smoke Management Plan would identify potential smoke impacts on class 1 airsheds and populated communities/areas that may be impacted. Desired and acceptable wind directions for smoke travel, and mitigation strategies would be included in the smoke management plan. The Forest Service would contact the county prior to burning to notify the planned amount of acres to be burned.

The log blocking the culvert in the tributary to Little Wallace Canyon between Unit 319-20 and Unit 319-21 in NE ¼ of Section 20 would be removed. It is preferable to remove this log by reach-in from the road. If reach-in from the road is not possible, equipment would enter and leave the RCA by the

route which causes the least potential disturbance in the RCA.

The partially blocked culverts on Forest Service Road 14N10C and 14N10H would be cleaned out.

TABLE 4 SITE SPECIFIC PROTECTION MEASURES FOR AQUATIC FEATURES FOR THE BIG GRIZZLY FUELS REDUCTION PROJECT

Aquatic Feature (Streams)	Protection measure(s)
Perennial streams	<p>***The RCA for all perennial streams is 300 feet as described in the SNFPROD of 2004***</p> <p>No ground disturbance, harvest, or mastication within <u>300</u> ft of any mapped or unmapped perennial streams.</p>
Intermittent streams	<p>***The RCA for all intermittent streams is 150 feet as described in the SNFPROD of 2004***</p> <ul style="list-style-type: none"> <li>Feature #1 (Mastication units 320-15, 320-77, and commercial thinning unit 320-71) (tributary to South Wallace Canyon. Site has buck-n-pole fence at lower end) - No mastication within 25' of feature. No harvest within 150 feet of channel for downstream half of feature. No ground based harvest equipment within 50 feet of channel and no harvest within 25' of channel for upstream half of feature.</li> <li>Feature #2 (main stem South Wallace Canyon and mapped ephemeral tributaries of South Wallace Canyon from Unit 320-14 upstream) - No ground based harvest equipment within 125 feet of South Wallace Canyon and no ground based harvest equipment within 75 feet of its tributaries. No harvest within 100 feet of South Wallace Canyon and no harvest within 50 feet of its tributaries. For both South Wallace Canyon and its tributaries, no mastication below the break in slope (in portions of the channel with a distinct slope break) or within 25 feet of feature, whichever is greater. Fell hazard trees in South Wallace Canyon towards the stream and leave on ground. Do not use landings within the RCA.</li> </ul> <p>Intermittent streams other than those described above: No ground disturbance, harvest, or mastication within <u>150</u> ft of any mapped or unmapped intermittent streams.</p>
Ephemeral streams & Swales	<p>***The RCA for all ephemeral streams is 150 feet as described in the SNFPROD of 2004***</p> <ul style="list-style-type: none"> <li>Feature #3 – (Units 317-15 and 317-32) No mastication within 25' of feature. Harvest not proposed.</li> <li>Feature #4 – (Units 317-43 and 317-44) No equipment, no harvest, and no mastication within 50 feet of feature or within bowl containing feature, whichever is greater.</li> <li>Feature #5<sup>1</sup> (this feature includes all ephemeral channels within Unit 318-17) - No harvest below slope break or closer than 100' from channel, whichever is greater. Mastication not proposed.</li> <li>Feature #6 – (Commercial thinning units 329-41, 330-16 and mastication unit 329-4) No ground based harvest equipment within 75 feet of channel. No harvest within 50 feet of channel. No mastication within 25 feet of feature. Do not use landing within RCA.</li> <li>Feature #7 (Commercial thinning unit 326-6 and brush cutting unit 326-26) (North Wallace Creek) – No ground based harvest equipment within 50 feet of feature. No mastication, brush cut, or harvest within 25' of feature. Do not use landing in RCA.</li> </ul> <p>Ephemeral streams other than those described above No ground disturbance, harvest, or mastication within <u>150</u> ft of any mapped or unmapped ephemeral streams unless surveyed by a hydrologist and a fisheries biologist prior to harvest or fuels reduction activities.</p> <p>Swales other than those described above No ground disturbance, harvest, or mastication within <u>25</u> feet from bottom of the feature. This pertains to unmapped features that lack scour, deposition, or a defined channel.</p>
Mapped and Unmapped aquatic features	<p>***The RCA for all special aquatic features is 300 feet as described in the SNFPROD of 2004***</p> <p>No ground disturbance, harvest, or mastication within <u>300</u> ft (91 m) of mapped or unmapped perennial springs, pools, wet areas, fens, or meadows, except as previously specified.</p>

\*An exception to design criteria in this table is that stream crossings on ephemeral channels may be designated at the discretion of the Sale Administrator with the following restrictions: (1) no more than one crossing per ephemeral channel would be installed without prior approval by the project hydrologist and aquatic biologist, (2) designated crossings would be consistent with all best management practices, (3) no crossing would be placed on a channel where a resource concern has been identified without the prior approval of the project hydrologist and aquatic biologist.

### **Roads and Trails**

Roads and trails within the project area would be managed consistent with the 2008 Eldorado National Forest Public Wheeled Motorized Travel Management Environmental Impact Statement (Travel Management EIS). Road reconstruction on roads not identified as open to public use would be blocked by gates, rocks, or other barriers. In addition to the seasonal closure identified by the Travel Management EIS, roads identified as open for public use may be temporarily closed during inclement weather to protect reconstruction investments until those roads have stabilized. Most of the proposed reconstruction is associated with the need to remove brush from roads that have been over-grown since the previous entry. Some reconstruction, including road rocking, would repair road running surfaces reducing the loss of existing native surface material. Reconstruction activities would also involve the replacement of inadequate drainage crossings, cutting or trimming of trees and brush for sight distance improvement, elimination of ruts, gate installation to control seasonal use or replacement of existing, non-functional gates or barriers, ditch repair, and installation of waterbars and dips on roads with inadequate runoff control.

The actual number of road miles that are reconstructed would be partially determined by the economics of the sale at the time of the project sell date. If the timber prices are up then more dollars/miles can be allocated to be reconstructed. If prices are down then the reconstruction miles would be proportionally less.

Easements or Road Use Permits would be obtained before timber haul or reconstruction is initiated in units accessed from identified haul roads on which easements are not currently held. In order to obtain rights of way, reciprocal agreements would be negotiated with private landowners.

Water would be used on native surface roads to maintain surface fines, minimize dust, and maintain surface compaction. Existing waterholes and other sites such as ponds, lakes, or streams, used for water drafting would be inspected for existing amphibians and flow levels prior to use. A Forest Service approved screen covered drafting box, or other device to create a low entry velocity (Riparian Conservation Objective (RCO) #4, SNFPA ROD p. A-56), would be used while drafting to minimize removal of aquatic

species, including juvenile fish, amphibian egg masses and tadpoles, from aquatic habitats.

### **Wildlife**

Within units proposed for thinning from below, un-thinned small trees and shrubs would be retained to provide escape or hiding cover and forage for wildlife species by not thinning trees 4 inches dbh and less and brush where it does not create a ladder fuel into the overstory canopy.

In plantations stands proposed for non-commercial treatments, approximately 5% of the plantation would not be treated in order to provide habitat diversity by leaving concentrations of trees or bush scattered at various locations within the treatment area. Preference would be directed towards retention of brush and/or tree cover in riparian areas, rocky outcrops, archaeological sites or other areas where less intensive management is most appropriate.

Selected individual trees and patches of trees that make up a second canopy layer would be identified and left to provide for horizontal and vertical structural diversity in units 318-4, 318-5, 319-13, 319-15, 319-19, 319-20, and 319-21.

The wildlife biologist would be involved in selection of hazard trees for removal on roads that enter or are adjacent to spotted owl or goshawk PACs. Felled hazard trees or cull logs would be left in down log deficient areas, as identified by the fisheries or wildlife biologist, or where there are insufficient down logs to comply with R-5, Soil Quality Standards (SQS) (USDA Forest Service 1995a).

Trees with identified wildlife

320-83, 320-91, 320-93, 324-19, 329-3, 329-4, and 329-42.

- March 1 to September 15 (Northern goshawks) units 319-15, 319-25 and 320-91.

If new nest locations are found before or during implementation, additional LOPs areas would be established.

### ***Mining Claims***

If it looks like access may be restricted to any persons holding active mining claims within the project area, mining claimants would be contacted. Access restrictions would be limited to the shortest period of time possible if restrictions are determined necessary to complete proposed activities.

### ***Range***

Range improvements would be protected during all stages of project implementation. To the extent practicable, a maximum stubble height of 8 inches would be required to facilitate livestock access and foraging in masticated areas.

In order to coordinate project activities with the permitted use of the project area, the Forest Service range specialist would be notified prior to implementation of project activities

### ***Cultural Resources***

The project would comply with Section 106 of the National Historic Preservation Act of 1966, as amended in accordance with provisions of the Programmatic Agreement among the USDA Forest Service, Pacific Southwest Region, the California State Historic Preservation Officer, the Advisory Council on Historic Preservation regarding the identification, evaluation, and treatment of historic properties managed by the national forests of the Sierra Nevada, California (Sierra PA) and the Programmatic Agreement among the USDA Forest Service, Pacific Southwest Region, the California State Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Undertakings on the national forests of the Pacific Southwest Region (Regional PA).

Cultural sites would be flagged for avoidance with mechanical equipment. No mechanical equipment would be allowed to operate within the boundaries of an identified cultural site. Where it is deemed necessary to remove trees from within established site boundaries, the District Archeologist would be consulted in order to mitigate impacts. All thinning of trees adjacent to site boundaries would be conducted so as to directionally fell trees away from the cultural resource site.

Sites that contain resources at risk from fire would be protected during burning operations. Fuels within the sites may be cut with hand tools, such as chainsaws and piled outside of the flagged boundaries. Burn piles would be placed away from sites at a distance far enough not to affect any site features from heat.

Construction of firelines would occur outside of the cultural resource site boundaries.

Hazard tree removal on or in the vicinity of cultural sites would be coordinated with the District Archaeologist and would follow the guidelines for hazard tree removal included in the Sierra Programmatic Agreement (PA), Attachment 7, IIE).

Use of existing braches in ditches to access treatment units would be coordinated with the District Archeologist and would follow the guidelines for hazard tree removal included in the Sierra Programmatic Agreement

Areas identified as culturally important for use by Native basketweavers that are identified before project implementation would be flagged for avoidance during herbicide applications.

### ***Sensitive Plants***

Known sensitive plant occurrences or those discovered during project implementation would be flagged for avoidance during project activities. Newly discovered locations would be reported to the forest botanist and district biologist.

Known occurrences of Fresno mat (unit 329-15) would be flagged for avoidance by equipment prior to mastication. Known occurrences of Pacific Yew communities outside RCA buffers would be flagged for avoidance (unit 330-18).

### **Noxious Weeds**

The project leader would notify the forest botanist prior to prescribed burn implementation in order to have known occurrences in burn units re-flagged. Re-flagging occurrences would clarify population boundaries and ensure that fire lines are not cut through occurrences.

Mulch or straw used for erosion control would be certified weed free. A certificate from the county of origin stating the material was inspected is required. If certified straw is not available, rice straw would be used. Onsite material may also be used if it is from a weed free area.

Occurrences of List A noxious weed species (e.g., scotch broom, yellow starthistle, rush skeletonweed, and spotted knapweed) would be flagged prior to project implementation and avoided by vehicles and equipment.

Locations of any new infestations of noxious weeds would be mapped, reported to the forest botanist, and documented for continued monitoring. Weed treatment would be accomplished as necessary using an Integrated Pest Management approach. New occurrences of List A noxious weed species would be treated by hand pulling (spring-summer before seed formation except rush skeleton weed), lopping in the late summer/early fall. Scotch broom in units 329-15 and 318-17 may be treated with herbicide as described above.

Ground disturbance or burning of Scotch broom occurrence in unit 318-017 would be avoided.

Mechanical treatments of weed free units would be scheduled before weed-infested units.

All off-road equipment would be cleaned to insure it is free of soil, seeds, vegetative matter or other debris before entering National Forest System lands to prevent the introduction or spread of noxious weeds. Prior to the start of operations, the Forest Service would do a visual inspection for such debris. Equipment also would be cleaned prior to moving from an infested unit to a weed-free unit.

Any seed used for erosion control or restoration would be from a locally collected source

### **Soils**

To maximize the period of operation that would limit soil compaction, the forest Soil Scientist and project Sale Administrator would collaborate as appropriate to identify portions of the project area with soils least susceptible to compaction. These areas would be targeted for initial early season activities where feasible.

Where woody debris are deficient according to Region 5 Soil Quality Standards, some trees killed during pile burning would not be removed, and additional logs may be left during thinning.

Piles of displaced soil from old site preparation operations, when present within treatment areas, would not be spread.

Fireline construction activities would not displace soil beyond the extent necessary to ensure fireline effectiveness.

Fifty percent (50%) cover would be preserved in units dominated by slopes less than 35 percent slopes with volcanic and sedimentary parent material.

Seventy percent (70%) cover would be maintained in units that contain a component of soils derived from granitic parent material.

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### **2.5-A- DESIGN CRITERIA FOR ACTION ALTERNATIVES THAT INCLUDE HERBICIDE APPLICATION**

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All appropriate laws, policies, and regulations governing the use of pesticides, as required by the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and the Forest Service Policy pertaining to pesticide-use, would be followed. All Forest Service personnel in charge of projects involving pesticide application would be Qualified Applicator Certified by DPR. All contract applicators would be appropriately licensed by the state. Coordination with the appropriate County Agricultural commissioner would occur, and all required licenses and permits would be obtained prior to any pesticide application.

Herbicide application would be restricted to ground based application. Backpack sprayers without a boom would be used to apply spray in sweeping motions.

With the method proposed, the herbicide is released through a handheld wand with a trigger that is controlled by the applicator. This allows the applicator to apply the herbicide over the target plant by moving their arm in a motion that covers the plant then to release the trigger stopping spray emission before moving on to the next target plant. The spray would be applied directly to targeted plants. Spraying would be stopped when moving between plants. Prior to the start of application, all spray equipment would be calibrated to insure accuracy of delivered amounts of pesticide. Spray nozzles would be required that produce a relatively large droplet. A low nozzle pressure (15 psi) would be required. Spray nozzles would be kept within a vertical distance of 24 inches of vegetation being sprayed. A pressure gauge or a pressure regulator would be required on backpack sprayers. Periodically during application, equipment would be rechecked for calibration.

Selective and non-selective herbicides are proposed for targeted control using a directed low-pressure spray. Triclopyr is selective for broadleaf plants including woody plants and would allow grasses to remain. Glyphosate is non-selective. A directed spray away from conifer seedlings and oaks as well as the use of physical barriers would be required where

appropriate. A seedling wash-down solution would be used for accidentally oversprayed seedlings.

Each treatment unit would be posted with a clearly visible sign along likely access points that the unit has been treated with pesticides. The specific pesticide would be identified, the treatment date specified, and the name and phone number of the appropriate contact would be identified.

Application would cease when weather parameters exceed label requirements, in the event of precipitation, or a forecast of greater than a 70% chance of precipitation in the next 24 hours. Application of Triclopyr would not occur when daytime high temperatures are forecasted to be above 70 degrees Fahrenheit or when surface temperatures of sprayed surfaces are expected to exceed 70 degrees Fahrenheit.

Additives in the form of colorants and adjuvants would be added to the herbicide mixtures. A colorant would be added to assist in the inspection process to determine the location of coverage. An ~~the~~ in



in a manner that allows contaminated water to enter any body of water on the National Forest.

A site specific spill plan would be updated annually and reviewed by all Forest Service personnel involved in the project, as well as by the contractor and the appropriate forest and district staff and line officers. A copy would be retained onsite during operations. Any herbicide application contract would contain clauses that would minimize the chances of herbicide spills such as: designating routes of travel and mixing sites, minimizing herbicide mix in tanks while traveling between units, requiring a separate water truck from the batch truck, and if a spill occurs,

outlining responses required by the contractor. Spill kits would be required in Forest Service and contractor vehicles on site and where contractor supplied pesticides are stored.

The following are minimum buffers for aquatic features for herbicide application. When wider buffers are required in the site specific protection measures for aquatic features for other activities, such as timber removal, mastication, and no ground disturbance, the wider buffers would be used for herbicide application as well. Spray application personnel would not be allowed into these buffers.

TABLE 6 STREAM BUFFER WIDTHS FOR HERBICIDE APPLICATION

Pesticide(s)	Buffer width on each side of perennial streams <sup>1</sup>	Buffer width on each side of all other streams <sup>1,3</sup>	Buffer width for special aquatic features <sup>2</sup>
Glyphosate	50 feet except in units 318-1 and 320-43, which would have a 500 foot buffer.	25 feet except in unit 320-67, which would have a 150 foot buffer.	50 feet
Triclopyr	75 feet	25 feet - dry channels. 50 feet - ephemerals and intermittents with water.	75 feet
<sup>1</sup> As measured from the edge of the stream channel. If a defined channel is not present (swales do not have defined channels), measurement is from the bottom of the feature. <sup>2</sup> As measured from the edge of the wet area surrounding the special aquatic feature. Special aquatic feature includes springs, seeps, bogs, fens, wet meadows, and all other wet areas. <sup>3</sup> Including roadside ditches with water present.			

## 2.6 MONITORING

Site-specific monitoring of project activities would be conducted if any of the action alternatives were implemented. This monitoring is designed to verify that the projects are implemented as designed, and are effective in meeting project and Forest Plan objectives.

The overarching purpose of monitoring is to provide feedback to the Forest that enables evaluation of the achievement of ecosystem health and sustainability and improvement of management to better meet the expectations of the public.

One aspect of monitoring looks at the degree to which the objectives, standards, and guidelines of the Forest Plan are being implemented. Another reason is to measure the effectiveness of management practices used in site-specific projects. Monitoring is also used to verify the assumptions and models used in planning.

Funding for monitoring may vary; this may lead to assessing priorities as needed to assure the integrity of Forest Plan monitoring and evaluation direction. The length of time needed for monitoring is determined by the results and evaluation of the activity or effect that is being monitored. When it is certain that regulations and standards are being met, monitoring of a particular element would cease. If monitoring evaluations show that regulations or standards are not being achieved at the desired level, management intervention would occur and monitoring would continue.

Predicting the effects from our land management activities also depends on research information. Research findings used for this project are in the References at the back of this EIS and/or in the resource specialist reports for this project.

The 1989 Land and Resource Management Plan identified 73 activities, effects, or resources to be measured. As a result of these duplicated and overly ambitious monitoring programs, and the high costs of the monitoring identified in Forest Plans, the

Forest is evaluating various monitoring strategies due both to changes in management needs and budgetary limitations.

### ***Project Level Implementation***

Project implementation generally involves the efforts of a variety of individuals with both specialized and general skills and training. Employees are accustomed to working together to achieve the desired project objectives. For example, it is common for a sale preparation forester or a sales administrator to discuss specific ground or project conditions with the wildlife biologist or soil scientist to apply the best practices on the ground. Joint field reviews are taken as needed. These steady informal communications allow for incremental project adjustment throughout implementation to achieve the desired results.

Herbicide treatments are monitored and evaluated during application by the contract officer or representative to determine whether pesticides have been applied safely, restricted to intended areas, and have not resulted in unexpected non-target effects.

### ***Wildlife***

Known nest sites for California spotted owl and Northern goshawk are visually inspected to determine occupancy. Surveys are conducted for additional nest sites during project planning or implementation. Nest site surveys have been conducted on this portion of the Georgetown Ranger District for a number of years by the regional demographic study.

### ***Timber Management***

Each active harvest unit would be visited at a frequency necessary to assure compliance with the timber sale contract by a certified timber sale administrator. Minor contract changes or contract modifications would be enacted, when necessary, to meet objectives and standards on the ground.

Units that are treated with regeneration harvest would be surveyed at one, three, and five year intervals following planting to certify regeneration.

### ***Water Quality***

Onsite evaluation protocols are used to assess the implementation and effectiveness of individual BMPs

or groups of closely related BMPs. Additional details can be found in Investigating Water Quality in the Pacific Southwest Region, Best Management Practices Evaluation Program (BMPEP) User's Guide (USFS, 2002) and Water Quality Management for National Forest System Lands in California (USFS, 2000).

Onsite evaluation protocols are applied to both randomly and non-randomly selected project sites. The number of random evaluations to be completed each year is assigned by the Regional Office, based on: 1) the relative importance of the BMP in protecting water quality; and 2) those management activities most common on the individual Forest. Forests supplement these randomly selected sites with additional sites based on local monitoring needs, such as those prescribed in an environmental document, or as required under the Regional Water Quality Conditional Waiver for Timber Sale Activities on Federal Land.

Implementation, effectiveness and forensic monitoring of the project would occur as defined in the Central Valley Timber Harvest Waiver Eldorado National Forest Monitoring Plan for the Georgetown District.

Monitoring for herbicide applications through the collection of water samples would be taken pre-application and post application. A site-specific water monitoring plan (project file) has been developed by the forest hydrologist for water quality. It would be implemented prior to application to determine baseline conditions. This monitoring would determine if the herbicides have moved off-site into water after application, through overland flow, leaching, or subsurface flow and would determine the amount of herbicide residue reaching water. The forest hydrologist, soil scientist, and district silviculturist would evaluate the results of the monitoring.

### ***Noxious Weeds***

Monitoring for new and expanding noxious weed populations would be conducted throughout project implementation and post treatment. Monitoring areas include areas of road reconstruction, road maintenance, and on landings.

Monitoring after prescribed burning would be conducted at documented noxious weed sites.

### ***Threatened, Endangered and Sensitive Plants***

Newly discovered Sensitive plant occurrences would be monitored after the completion of the project to ensure that protection measures were effective.

#### ***Access Management***

Traffic control barriers on proposed road construction and reconstruction on roads not designated in the 2008 Eldorado National Forest Travel Management FEIS would be monitored during the implementation phase of the project and following the project to determine the effectiveness of travel restriction methods.

#### ***Fuel Treatment***

Fuel treatment prescriptions and accomplishments would be entered into the FACTS database; and walk through surveys would be conducted after work is completed.

#### ***Need for Herbicide***

Effectiveness of initial treatments of mastication, brush cutting, or herbicide application would be visually monitored to determine need for follow-up herbicide treatment. Post-project monitoring would determine the effectiveness of treatment in meeting the project objectives.

and rate of spread. Cutting trees less than 12” dbh would modify the vertical and horizontal distribution of fuels, breaking the fuel ladder from surface fuels to the middle and upper canopy of intermediate and larger dominant and co-dominant trees.

In a 12” diameter limit alternative, the removal of trees would not generate funds which would contribute to completion of project activities. If the 12 inch diameter alternative were implemented as a timber sale, \$1,051,619 in supplemental funding would be required to remove the trees between 9 and 12 inches dbh in addition to the cost of removal of smaller trees, brush, piling, pile burning, mastication, and herbicide treatment. It is highly unlikely that a project composed of trees no larger

## 2.7 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

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### 2.7-A - 12-INCH DBH LIMIT WITH NO GAP EXPANSION

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Treatments proposed would remain the same as the Proposed Action except that units proposed for commercial thinning in the Proposed Action would have a 12-inch maximum diameter limit for removal in this Alternative. Additionally, no gap expansion and no planting with follow-up release treatments would occur in stand improvement units.

A 12 inch diameter limit would retain an average of 17 trees per acre greater than 12 inches compared to the Proposed Action (Errington, 2009). Removal of trees of less than 12” dbh would meet the fuels objective of reducing ladder fuels and surface fuel loadings; thereby reducing the fire behavior characteristics of fireline intensity, crown fire potential, flame length

removal of the 12 inch dbh and

improvements in a cost-effective manner to maximize program effectiveness and ensure that sufficient treatments occur to have a reasonable likelihood of changing landscape fire behavior and providing improved landscape-scale forest resilience.

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### 2.7-B – 16-INCH DBH LIMIT WITH NO GAP EXPANSION

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Under this alternative, the general treatments proposed would remain the same as those included in the Proposed Action except that those units proposed for commercial thinning in the Proposed Action would have a 16-inch maximum diameter limit for removal and no gap expansion and no planting with follow-up release treatments would occur in stand improvement units.

A 16 inch diameter limit would retain an average of 10 more trees per acre greater than 16 inches compared to the Proposed Action (Errington, 2009). Removal of trees less than 16" dbh would meet the fuels objective of removing hazardous fuel loadings thereby reducing the fire behavior characteristics of fireline intensity, crown fire potential, flame length and rate of spread. Cutting trees less than 16" dbh would modify the vertical and horizontal distribution of fuels, breaking the fuel ladder from surface fuels to the upper canopy of the large dominant and co-dominant tree species. However, under the 16" dbh limit, more surface activity fuels may be left, when compared to the Proposed Action, due to decreased maneuverability of equipment. Additionally, during pile burn operations, increased tree mortality may result as piles may be placed close to retained trees due to increased residual density (Ebert, 2009).

Under the 16" diameter limit, the removal of trees would not generate funds which contribute to completion of project activities. Under this alternative logging costs exceed the values of timber by \$879,706. This means that in addition to the cost of small tree removal, brush cutting, mastication, herbicide piling, and pile burning, the removal of trees between 9 and 16 inches would cost almost \$900,000. It is highly unlikely that this sale would sell (Errington, 2009).

The number of acres treated may be less than the amount needed to modify fire behavior because of funding limitations. It is estimated that a minimum of approximately 4,000 acres within the project area would need to be treated to meet the purpose and

need of performing fuel treatment activities designed to change existing forest surface, ladder and crown fuel profiles in order to reduce potential wildfire intensity and behavior at the landscape level. Areas proposed for treatment, that are eliminated or not completed would retain their current fuel loading and structure. These areas would continue to support problem and extreme fire behavior (Ebert, 2009).

Treatments involving only the removal of trees less than 16 inches dbh would not fully meet objectives to increase forest resilience by improving stand vigor and resistance to disease and insect mortality in degraded stands. On average stand densities would be reduced to 50% of the maximum density for ponderosa pine, which should provide those trees reduced competition and better assure their resilience. However, over 1/3 of the project units are not expected to fall below the 60% threshold of concern for ponderosa pine and within the short-term almost half of the project units are expected to be at a level of concern. Because stand densities would not be reduced sufficiently, ponderosa pine, sugar pine, Douglas-fir and black oak would remain at increased risk for drought, insect attack mortality over a majority of the project area and therefore objectives to improve stand vigor and resilience would not be fully achieved. Given that these areas already have a limited supply of moisture and nutrients, excessive numbers of trees impedes individual tree growth and vigor. (Walsh, 2009).

Treatment with a 16 inch diameter limit and no gap expansion would not restore portions of the forest to the composition of tree species and size classes that are closer to the historic conditions for the area and that are likely to be sustainable into the future considering the biophysical and climatic conditions of the area. The majority of the additional trees retained are white fir and incense cedar which would not aid in improving the species composition of the treatment units or the project area. No improvements to species composition are expected to occur in stand improvement units without the expansion of existing gaps and planting of desired species. In these stands canopy cover would continue to decrease as the expansion of Annosus root disease and insects within the stands continues to kill the predominately large areas of white fir (Walsh, 2009).

As discussed above, this alternative would not treat hazard fuels and implement forest health improvements in a cost-effective manner to maximize

program effectiveness and ensure that sufficient treatments occur to have a reasonable likelihood of changing landscape fire behavior and providing improved landscape-scale forest resilience.

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### 2.7-C – 2001 FRAMEWORK ALTERNATIVE

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Treatments proposed would remain the same as the Proposed Action except that units proposed for commercial thinning in Alternative 1 would have a 12-inch maximum diameter limit for removal in the 2978 acres of Old Forest and Home Range Core Area (HRCA) land allocations and a 20-inch maximum diameter limit for removal in the 1010 acres of the General Forest land allocation.

Decreasing the current fuel loading of surface fuels and breaking the arrangement of aerial fuels would meet the objective of decreasing potential fire behavior within the treatment units and across the landscape. Effects of a 12 inch diameter limit are described above. In some units, the removal of the 12 inch and smaller material may reduce stand density sufficiently as to allow reasonable access for the needed equipment, however in a number of stands it is expected that stand density would preclude effective or efficient equipment access if only the 12 inch and smaller trees were removed. Surface fuel loads would be expected to be higher than the Proposed Action due to the reduced maneuverability of equipment within the treatment units with 12 inch diameter limits. During pile burn operations, mortality rates of trees surrounding the piles may increase due to the number of trees left onsite and the canopy cover of these trees in relation to pile location.

Logging costs with this alternative would exceed the value of the timber by approximately \$900,000. This means that in addition to the cost of small tree removal (<9 inches dbh), brush cutting, mastication, herbicide, tractor piling, and pile burning, the trees greater than 9 inches proposed for removal would cost approximately \$900,000. With costs substantially exceeding the value of products removed it is highly unlikely that this sale would sell (Errington, 2009).

The number of acres treated may be less than the amount needed to modify fire behavior because of funding limitations. It is estimated that a minimum of approximately 4,000 acres within the project area would need to be treated to meet the purpose and need of performing fuel treatment activities designed

to change existing forest surface, ladder and crown fuel profiles in order to reduce potential wildfire intensity and behavior at the landscape level. Areas proposed for treatment, that are eliminated or not completed would retain their current fuel loading and structure. These areas would continue to support problem and extreme fire behavior (Ebert, 2009).

In the approximately 1,010 acres of General Forest treated with a 20 inch diameter limit, stand density and structure and species composition are expected to be similar on the treated areas to those effects described in Alternative 1, since very few trees per acre above 20 inches would be removed with the Proposed Action. Benefits from treatment described under Alternative 1 would be reduced however by limiting treatment to those trees below 20 inches in areas with higher stand densities and by reducing the potential to positively influence species composition. Also, growth and potential survival of trees planted in expanded canopy gaps would be reduced with the additional tree retention (Walsh, 2009).

Average stand densities would remain above 60% of the maximum for ponderosa pine, meaning that the majority of the project units if treated with a 12 inch diameter limit are not expected to fall below the threshold of concern for ponderosa pine. Because stand densities would not be reduced to a level that is below the threshold of concern, ponderosa pine, sugar pine, Douglas-fir and black oak would still remain at increased risk for drought and insect attack mortality and therefore objectives to improve stand vigor and resilience would not be fully achieved. Given that these areas already have a limited supply of moisture and nutrients; excessive numbers of trees on them further impedes individual tree growth and vigor. (Walsh, 2009).

Treatment with a 12 inch diameter limit would not restore portions of the forest to the composition of tree species and size classes that are closer to the historic conditions for the area and that are likely to be sustainable into the future considering the biophysical and climatic conditions of the area. The majority of the additional trees retained in the 12 inch dbh limit alternative are white fir and incense cedar which would not aid in improving the species composition of the treatment units or the project area. No improvements to species composition are expected to occur in stand improvement units without the expansion of existing gaps and planting of desired species which would be limited to areas



with a 20 inch diameter limit. In these areas canopy cover would continue to decrease as the expansion of Annosus root disease and insects within the stands continues to kill the predominately large areas of white fir (Walsh, 2009).

As discussed above this alternative would not treat hazard fuels and implement forest health improvements in a cost-effective manner to maximize program effectiveness and ensure that sufficient treatments occur to have a reasonable likelihood of changing landscape fire behavior and providing improved landscape-scale forest resilience.

### 2.7-D – HAND THINNING AND PRESCRIBED FIRE ALTERNATIVE

In this alternative, precommercial thinning treatments would be implemented by hand. Units proposed for commercial thinning with the Proposed Action would be treated with hand thinning vegetation up to 16" diameter where needed to introduce prescribed fire. Material would be hand piled and burned before implementation of prescribed fire.

With this alternative no mechanical treatments would occur, which would leave stands proposed for mastication untreated at this time due to the high levels of brush in these stands which make both prescribed burning and hand treatment extremely unsafe and infeasible. Effects to these non-commercial stands from no treatment are described in Alternative 2 (No Action).

Utilizing crews for hand thinning and piling would meet fuels objectives of reducing surface fuels, increasing canopy base heights, and modifying the vertical and horizontal fuel structure (the ladder effect). This process would take additional years to complete when compared with the Proposed Action due to use of personnel rather than machines. Surface fuel loading within the treatment units would not be reduced with hand thinning alone. Additional use of understory prescribed burning would be required to reduce the current surface fuel loading in conjunction with the hand piling. Upon completion of pile burning, re-entry with use of understory prescribed fire would be needed to reduce surface fuel loads. A realistic goal of prescribed fire use would be approximately 700 acres per year. Constraints to implementation include air quality, resource and

equipment availability (Ebert, 2009). Costs to implement hand thinning, hand piling, pile burning, and prescribed burning are estimated to be over \$5,000,000.

The prescribed fire only treatment would not be an effective means to meet the objectives for fuels treatment due to the length of time needed to complete the project mainly as a result of the availability of personnel and equipment and air quality restrictions related to prescribed burning (Ebert, 2009). The initial prescribed fire treatment may increase fire behavior variables by increasing the amount of residual standing dead material which would eventually fall to the ground increasing surface fuels. Stephens, Moghaddas and others (2009), researched various fire treatment effects on structure, fuels and fire severity. Their findings included: fire effects may be exacerbated, due to the increased fuel load, when the sites burns again, although the effects should be patchy. Additionally, woody debris would accumulate increasing surface fuel loads and shortening the longevity of the fuels treatments (Ebert, 2009).

Experiences with hand thinning and pile burning on the Lake Tahoe Basin Management Unit have shown that even with 20 to 25 foot spacing between residual trees, high mortality and creation of additional standing fuels after pile burning and initial prescribed burn should be expected due to root damage and damage to tree boles. This mortality and damage is a result of quantity of fuels within piles and between piles, and the fact that thick duff layers are present.

Because stand densities would not be reduced to a level that is below the threshold of concern, ponderosa pine, sugar pine, Douglas-fir and black oak would still remain at increased risk for drought, insect attack and disease mortality and therefore objectives to improve stand vigor and resilience would not be fully achieved. Given that these areas already have a limited supply of moisture and nutrients; excessive numbers of trees on them further impedes individual tree growth and vigor.. No improvements to species composition are expected to occur in stand improvement units without the expansion of existing gaps and planting of desired species. In these stands canopy cover would continue to decrease as the expansion of Annosus root disease and insects within the stands continues to kill the predominately large areas of white fir (Walsh, 2009).

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## 2.7-E –PRESCRIBED FIRE ONLY ALTERNATIVE

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This alternative would use prescribed fire as the only s 

may delay implementation of the project and/or cause a reduction in the amount of area treated due to the complexity of conducting prescribed fire operations under current conditions (Ebert, 2009).

The Prescribe Burn Only Alternative also increases short-term risk of high intensity wildfire as burning may increase fuel loading in the short term due to the mortality of the smaller diameter trees currently in the stand. With initial burn only treatments woody debris are expected to accumulate, increasing surface fuel loads and shorten the longevity of the fuels treatments (Ebert, 2009). In Stephens et al (2009) research on various fire treatment effects on structure, fuels and fire severity resulted in findings that fire effects may be exacerbated when stands burn after initial prescribe burn only treatments due to the increased fuel load. It is expected that results would be patchy.

At the time of the second prescribed burn entry, the surface fuel loading would be expected to have returned to near the same pre-initial prescribed burn levels in much of the area from accumulated dead fuel and natural needle cast and other vegetation falling to the ground. Dead patches of trees would exist in the area from the previous burn as well. Implementation of the second burn would again reduce the 1 and 10 hour fuel loading across the project area. Less mortality would be expected as there is a reduction crown fire potential due to increased canopy base heights and reduction of ladder fuels from the initial entry burn. However, isolated pockets of mortality would arise where larger diameter and/or heavy surface fuel loadings allowed for post fire combustion to smolder and burn for an extended period of time.

By using prescribed fire as the only means of treatment with this project, objectives to improve stand vigor and resistance to disease and insect would be compromised as stand density would not be reduced sufficiently to provide for short or long-term health of ponderosa pine, sugar pine, California Black oak, or Douglas-fir within most treatment units (Walsh, 2009). Additionally, within dense stands with heavy fuel loading insect mortality may actually increase under the Prescribed Fire Only Alternative due to damage of residual trees. While insect attack and mortality are influenced by a number of factors including: proximity to surrounding beetle populations, other potential hosts available for the beetles, degree of fire-injury, drought conditions,

stand density, individual tree vigor and other factors, given current stressed conditions for trees within these stands, additional damage to trees from implementation of prescribed burning is likely to result in increased incidence of insect attack within burned stands, and could negatively impact objectives to maintain desired residual trees, especially large pines that are desired for preservation with the project (Walsh, 2009). Maloney et al. (2008) found that three year post-Rx burn bark beetle-

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Creating some gaps within treatment units to encourage pine establishment would be possible under current fuel conditions; however, targeting individual trees, size classes or a select species of trees (white fir and incense cedar) would not be possible. Overstory trees, ponderosa pine and sugar pine would also experience mortality as a result of burning. Natural regeneration of these species would be possible in stands with a viable seed source, but species establishment is highly dependent on annual seed dispersal, weather and pest patterns, and seed bed conditions (Walsh, 2009). Implementation of gap expansion within stand improvement units of currently identified gaps would not be possible. No improvements to species composition are expected to occur in stand improvement units without the

expansion of existing gaps and planting of desired species. In these stands canopy cover would continue to decrease as the expansion of Annosus root disease and insects within the stands continues to kill the predominately large areas of white fir (Walsh, 2009).

## 2.8 COMPARISON OF ALTERNATIVES

The maps and tables in this section present summaries and comparisons of alternatives. A further comparison for each treatment unit is provided in Appendix A along with maps of the treatments proposed with Alternative 1.

TABLE 7 ACRES OF PROPOSED TREATMENT IN EACH LAND ALLOCATION WITH EACH ALTERNATIVE

Land Allocation <sup>1</sup>	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Acres of Old Forest	0	1150	1150	942	1150	1098
Acres of Seasonal Streams	0	668	666	552	668	623
Acres of Perennial Stream	0	131	131	114	131	127
Goshawk PAC	0	19	19	19	19	19
CSO PAC	0	219	219	198	219	238
CSO HRCA <sup>2</sup>	0	5751	5751	4309	5751	5000

<sup>1</sup> Multiple land Allocations may overlap the same acre of land, resulting in the same acre being counted multiple times. For example, an area may be SPLAT, Old Forest, and HRCA, and thus will be counted in all three land allocations.

<sup>2</sup> Acres with overlapping HRCA for different owls are counted for each habitat resulting in some acres being counted more than once.

TABLE 8 ACRES OF TREATMENT TYPE WITH EACH ALTERNATIVE

Item	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Acres of Treatment with Commercial Thinning from Below with Follow-up Tractor Piling or Mastication	0	3,054	3,054	2,240	0	2,619
Acres of Thinning from Below to 6 inches by Hand	0	40	40	40	40	40
Acres of Stand Improvement Units with Commercial Thinning from Below and Expansion of Canopy Gaps	0	890	890	890	890	890
Acres of Treatment of Annosus Root Disease through Expansion of Canopy Gaps and Planting within 890 acres of Stand Improvement Units	0	80	80	80	0	80
Acres of Stump Treatment with Sporax or equivalent	0	2,682	2,682	1,862	0	2,223
Acres of Biomass Removal	0	3,990	3,990	3,170	3,990	3,509
Maximum Acres of Tractor Piling and Brush Cutting for Fuel Ladder Conditions <sup>3</sup>	0	3,550	3,550	2,735	3,550	3078
Acres of Hand Grubbing	0	0	100	0	0	0
Approximate Acres of Proposed Mastication	0	1,180	2,150 (initial and follow-up treatment)	1,180	1,180	1,180
Acres of Proposed Herbicide Use	0	1,200	0	1,200	1,100	1,200
Maximum acres of Prescribed Burning <sup>4</sup>	0	3,330	3,330	2,410	4,220	2,753

<sup>3</sup> Because not all acres that are proposed for thinning or stand improvement would have tractor piling or brush cutting this would be reduced. However, until implementation it is not possible to accurately estimate how many acres would not need tractor piling or brush cutting.

<sup>4</sup> It is likely that not all the proposed prescribe burning would be accomplished with this project due to burn restrictions and work capacity. Higher priority areas for burning would be accomplished first, while areas with less maintenance need would be less of a priority for burning. Future projects are expected to prescribe maintenance treatments of these stands if prescribe burning is not fully implemented, however, the need for maintenance and the types of treatment cannot be accurately estimated at this time.

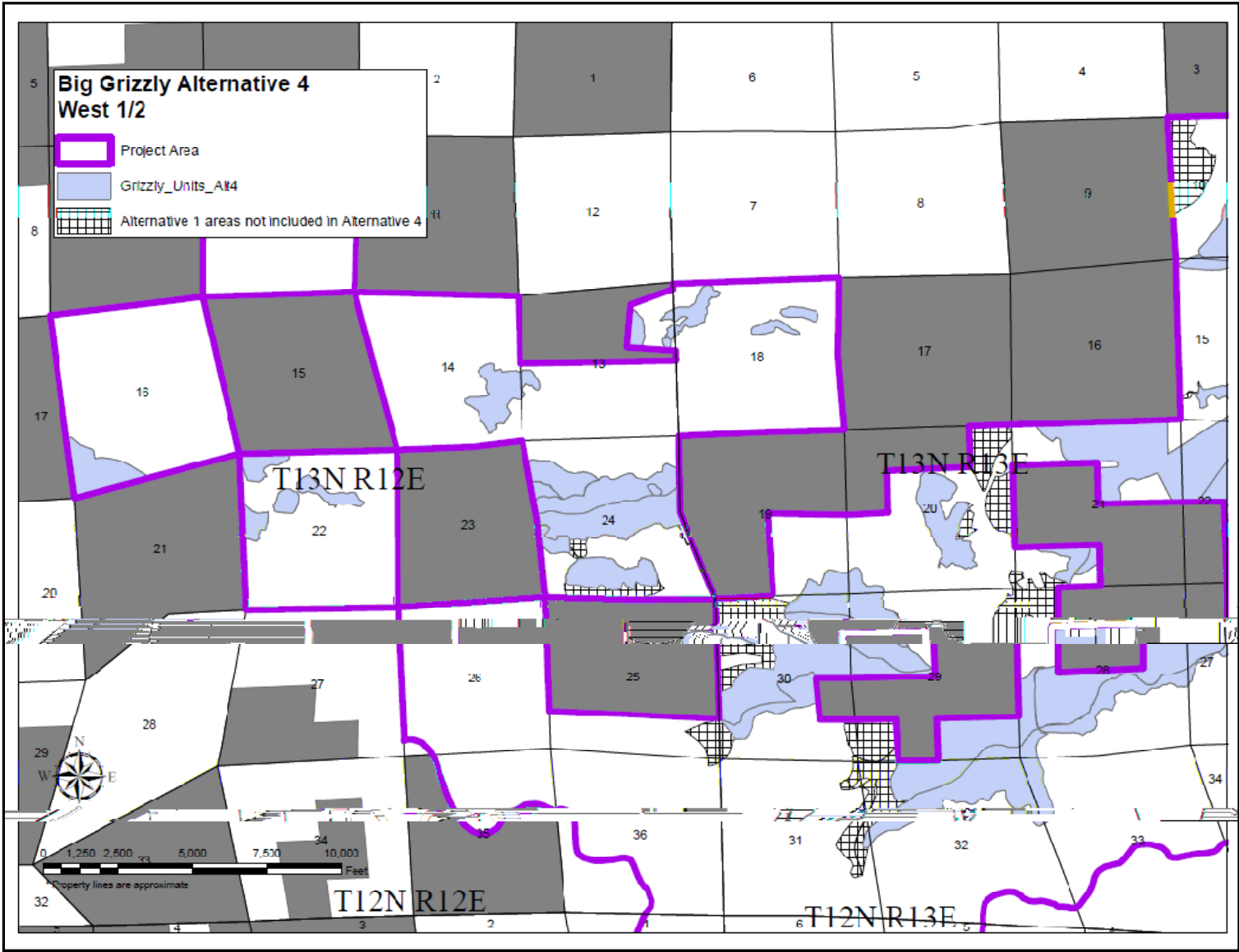


FIGURE 6 MAP COMPARISON OF WESTERN ½ OF THE PROJECT AREA FOR ALTERNATIVE 1 AND ALTERNATIVE 4



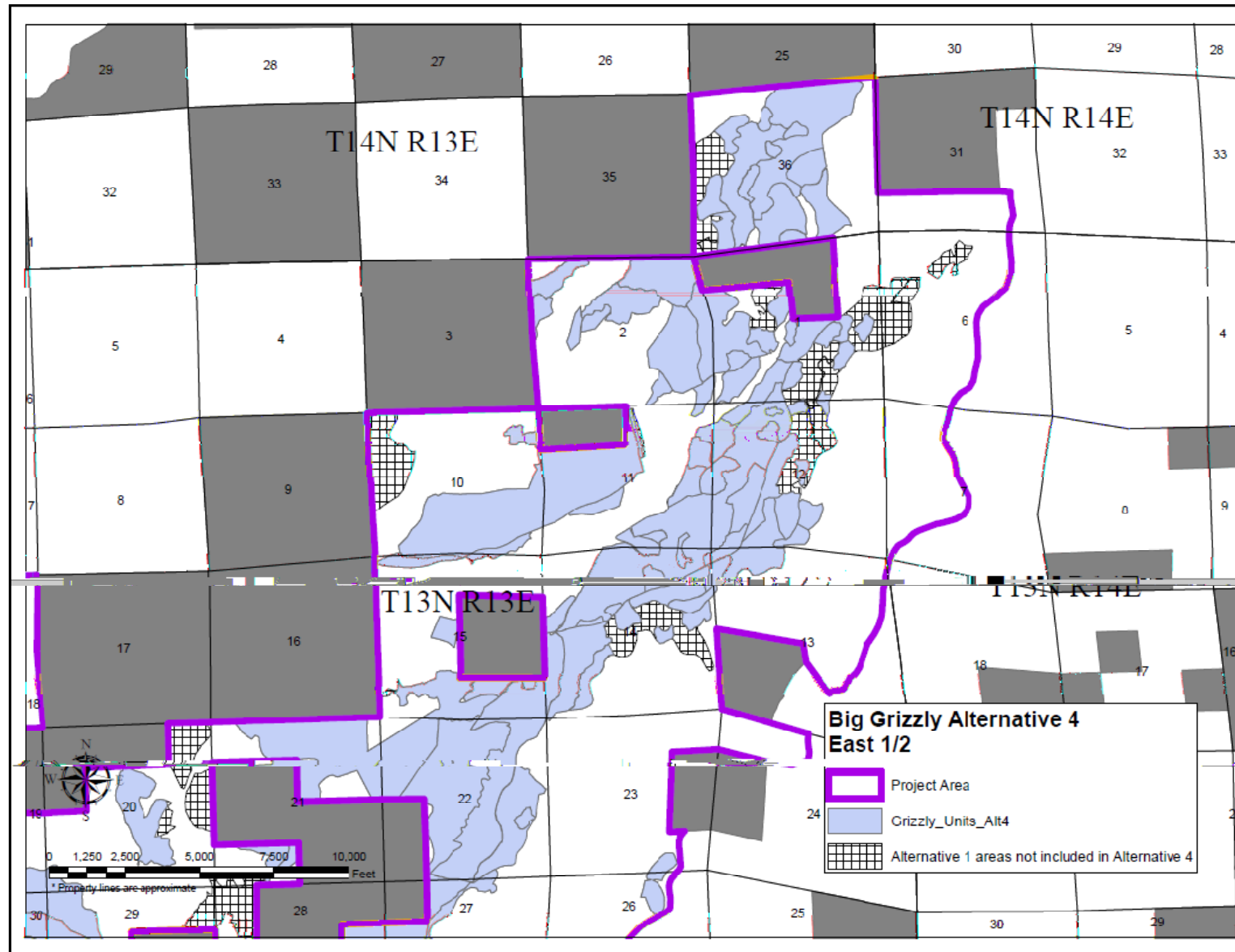


FIGURE 7 MAP COMPARISON FOR THE EASTERN ½ OF THE PROJECT AREA FOR ALTERNATIVE 1 AND ALTERNATIVE 4

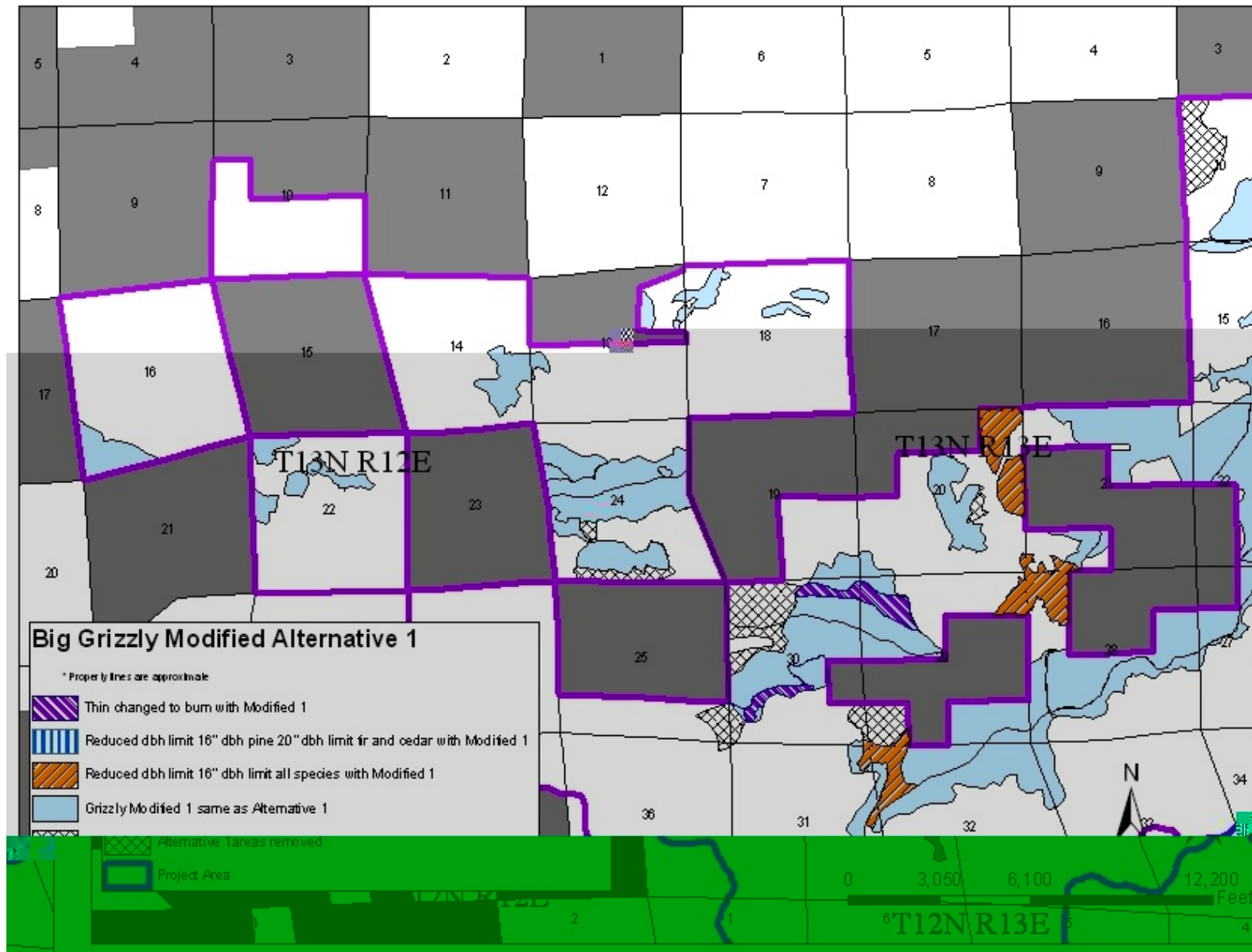


FIGURE 8 MAP COMPARISON FOR THE WESTERN ½ OF THE PROJECT AREA FOR ALTERNATIVE 1 AND MODIFIED ALTERNATIVE 1

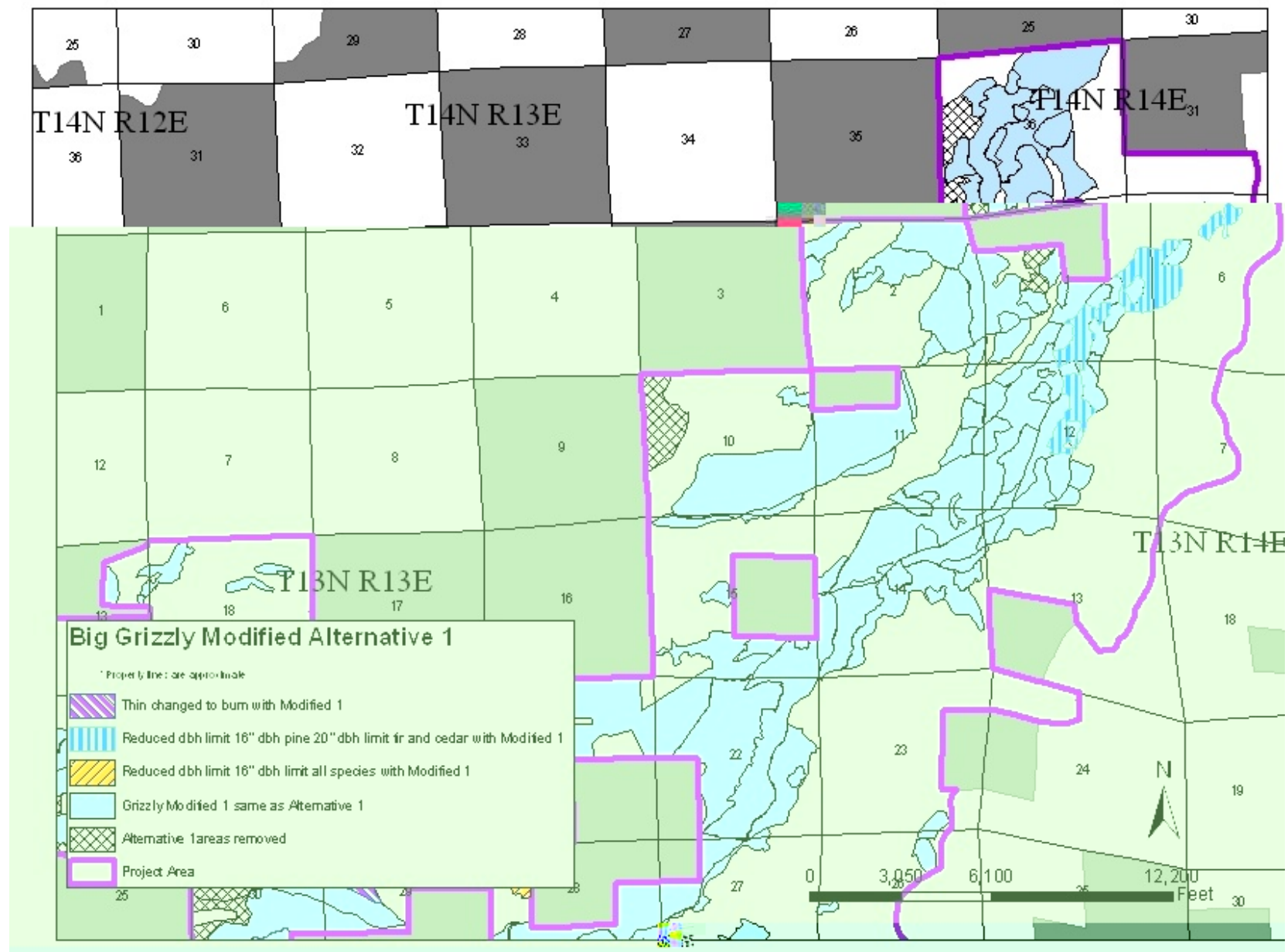


FIGURE 9 MAP COMPARISON FOR THE EASTERN 1/2 OF THE PROJECT AREA FOR ALTERNATIVE 1 AND MODIFIED ALTERNATIVE 1

TABLE 9 PREDICTED EFFECTS TO FIRE BEHAVIOR WITH EACH ALTERNATIVE

Item	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Acres of identified Strategically Placed Landscape Area Treatment accomplished	0	3,369	3,369	3,009	3,369	3,147
Spatial pattern of treatments produces reduced rate of fire spread and fire intensity at the head of the fire	No	Yes	Yes	Yes	Yes	Yes
Acres of Flame Length Less than 4 feet during 90 <sup>th</sup> Percentile Weather Within Treatment Units	2,220	5,431	5,429	4,847	5,431	Between 5,429 and 4,847
Acres of Flame Length Greater than 4 feet during 90 <sup>th</sup> Percentile Weather Within Treatment Units	3,504	297	297	881	297	More than 297 but less than 881
Acres of Potential Fireline Intensities Less Than 100/btu/sec during 90 <sup>th</sup> Percentile Weather Within Proposed Treatment Units	2,215	5,017	5,017	4,314	5,017	Between 4,314 and 5,017
Acres of Potential Fireline Intensities Greater Than 100/btu/sec during 90 <sup>th</sup> Percentile Weather Within Proposed Treatment Units	3,513	711	711	1,414	711	More than 711 but less than 1,414
Acres expected to burn as surface fire during 90 <sup>th</sup> Percentile Weather Within Treatment Units	2,195	5,728	5,728	4,943	5,728	Between 5,728 and 4,943
Acres with Passive or Active Crown Fire during 90 <sup>th</sup> Percentile Weather Within Treatment Units	3,533	0	0	785	0	More than 1 but less than 785

\*This table does not show potential fire activity within the project area outside of treatment units.

Modeling of fire growth and intensity with the Farsite modeling program, for a 24 hour burn period shows that placement of treatment units with both Alternative 1 and 4 decrease fire intensity on the landscape by reducing rate of spread, fireline intensity, flame length and crown fire activity from the No Action Alternative. The decrease in intensity results in an overall decrease in the fire perimeter for the 24 hour period. Alternative 1 provides the greatest reduction in potential fire behavior and fire size. Compared to Alternative 1, Alternative 4 increases rate of spread, fireline intensity, flame-length, and crown fire activity within portions of the project area by not treating areas that restrict fire movement and buildup of fire intensity, resulting in a higher severity and larger fire over the 24 hour burn period. Ignition points 1, 3, and 4 highlight areas where the reduced treatment with Alternative 4 would result in higher intensity and larger areas burned compared to Alternative 1.

# Ignition 1

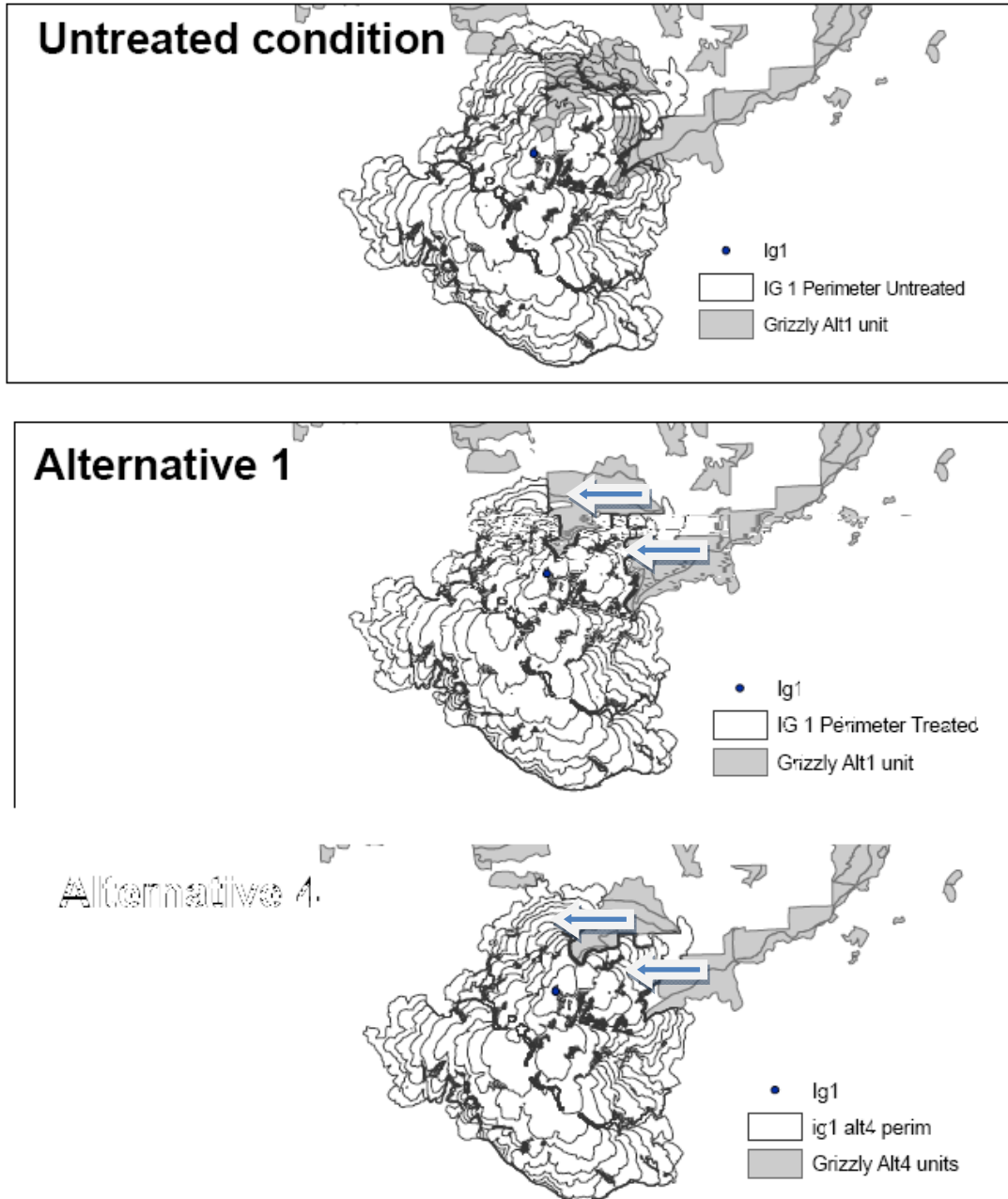


FIGURE 10 FARSITE MODELED 24 HOUR FIRE PERIMETER GROWTH COMPARISON FOR IGNITION POINT 1

# Ignition 2

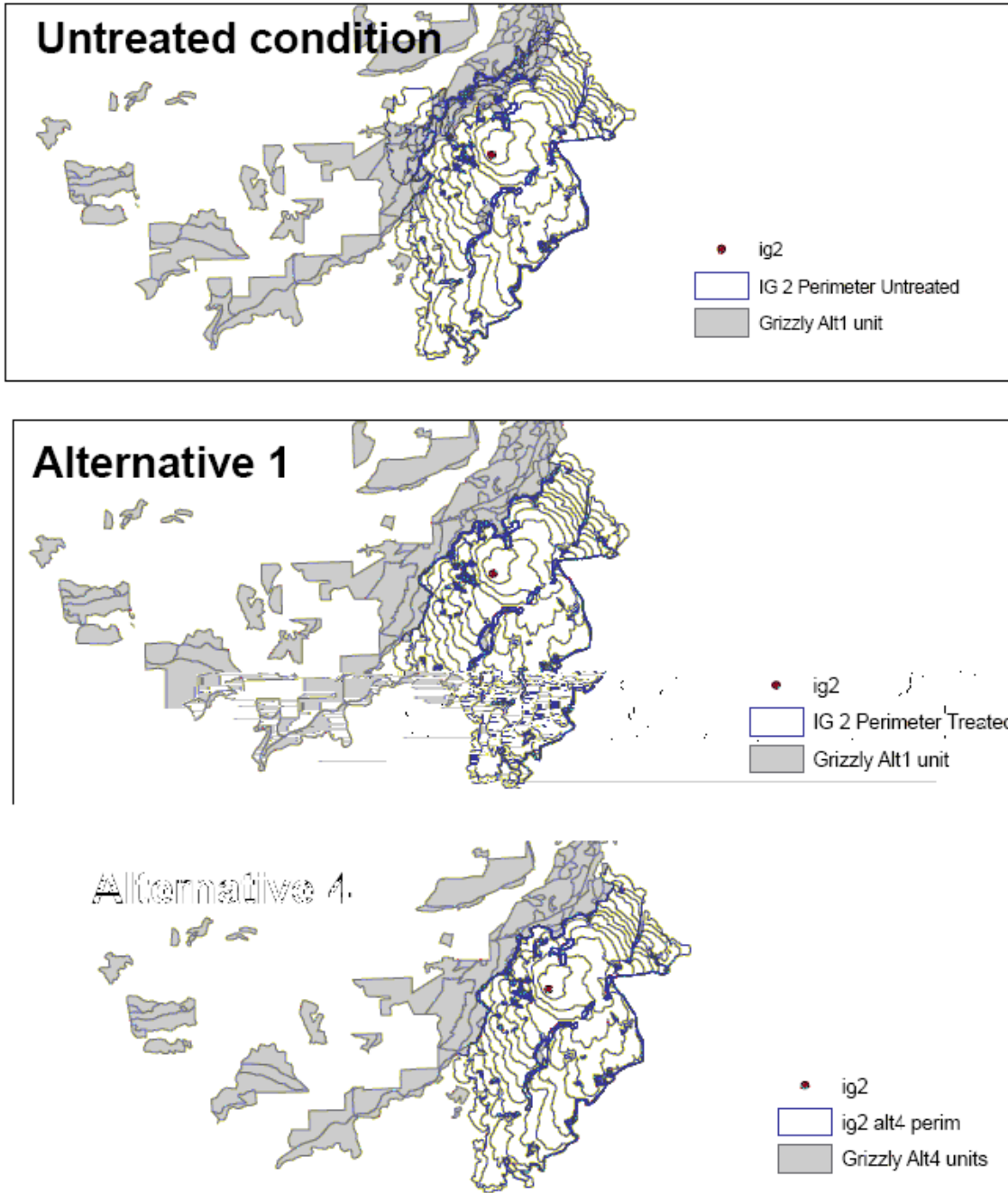


FIGURE 11 FARSITE MODELED 24 HOUR FIRE PERIMETER GROWTH COMPARISON FOR IGNITION POINT 2



# Ignition 3

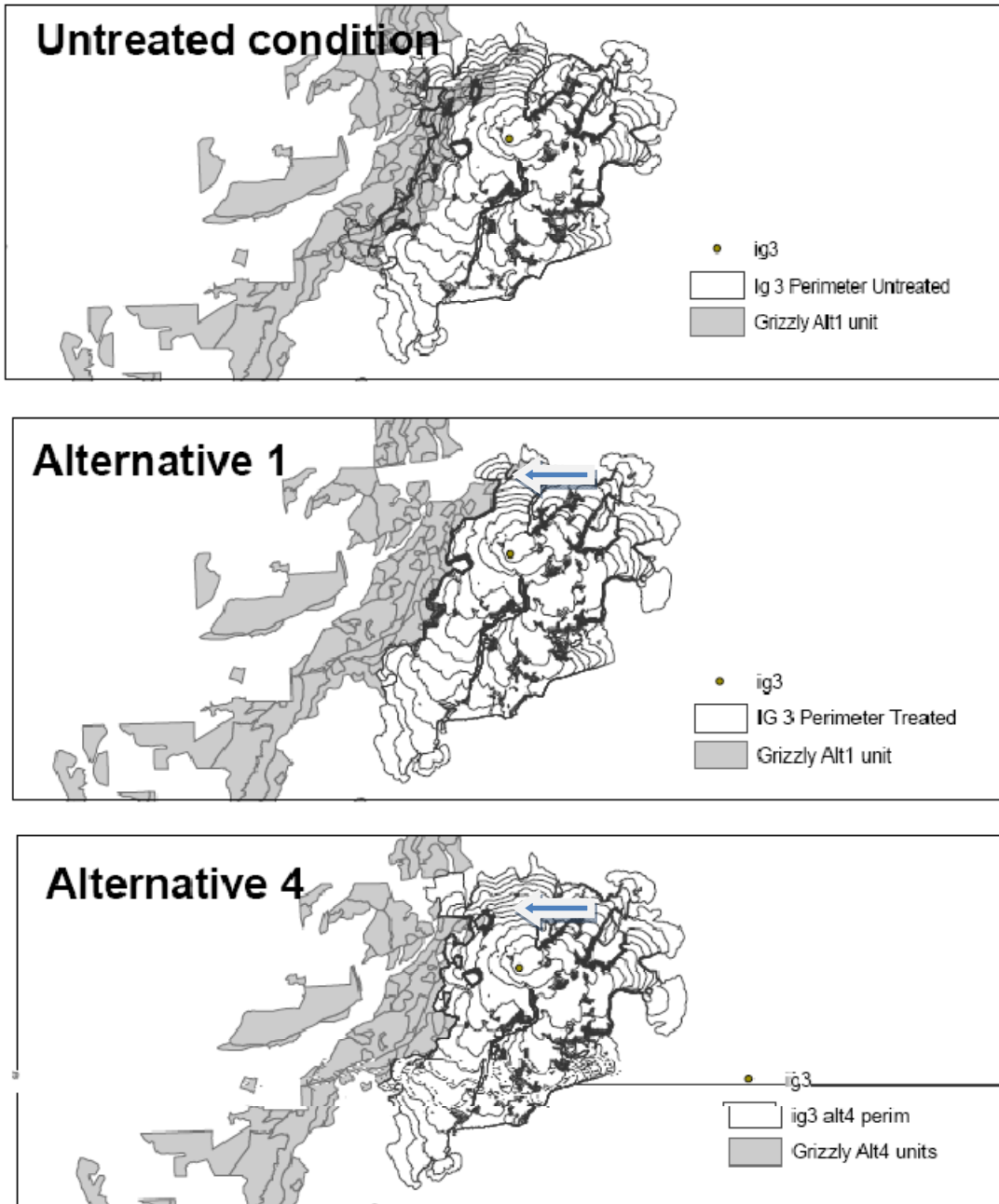


FIGURE 12 FARSITE MODELED 24 HOUR FIRE PERIMETER GROWTH COMPARISON FOR IGNITION POINT 3

# Ignition 4

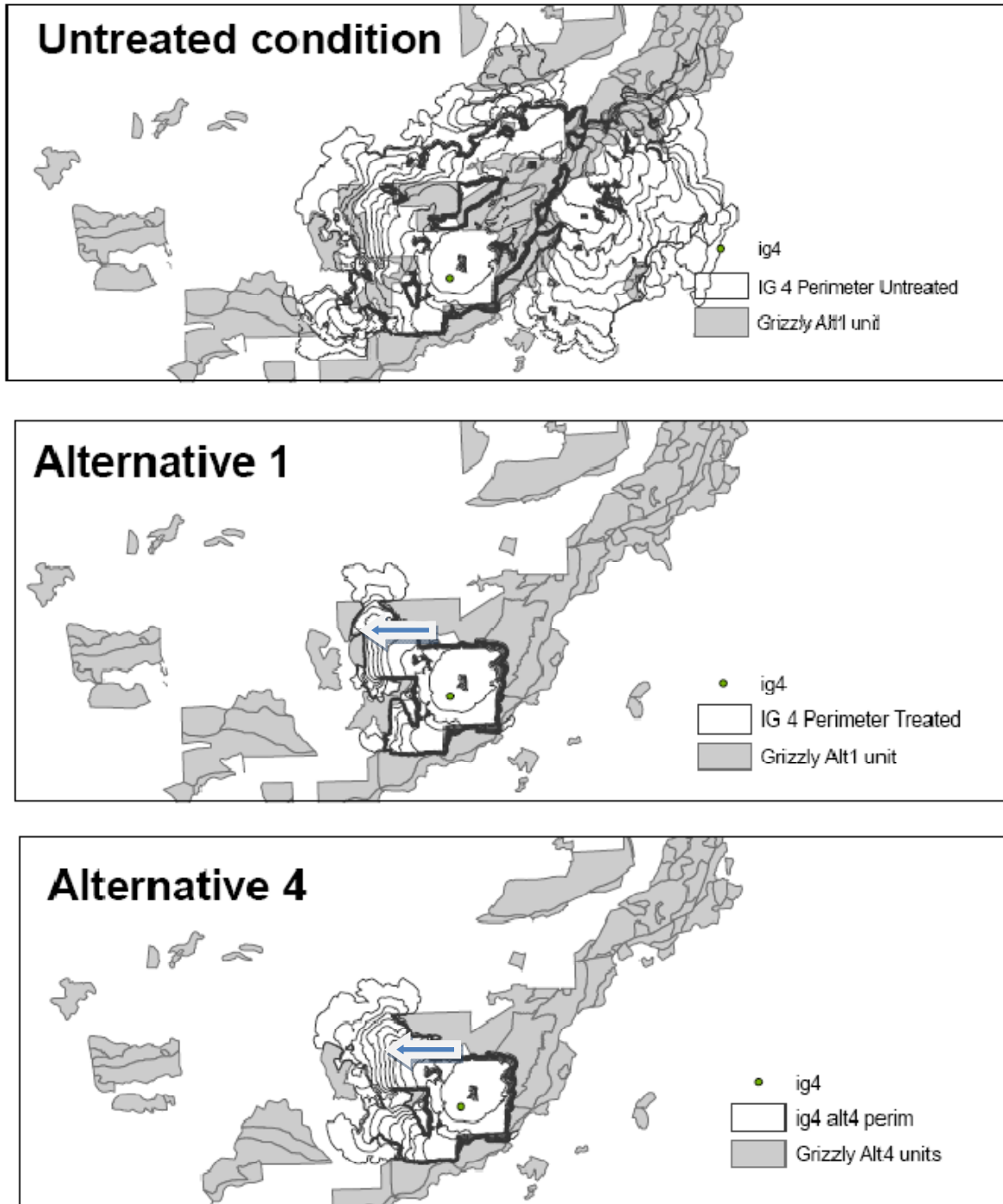


FIGURE 13 FARSITE MODELED 24 HOUR FIRE PERIMETER GROWTH COMPARISON FOR IGNITION POINT 4

# Ignition 5

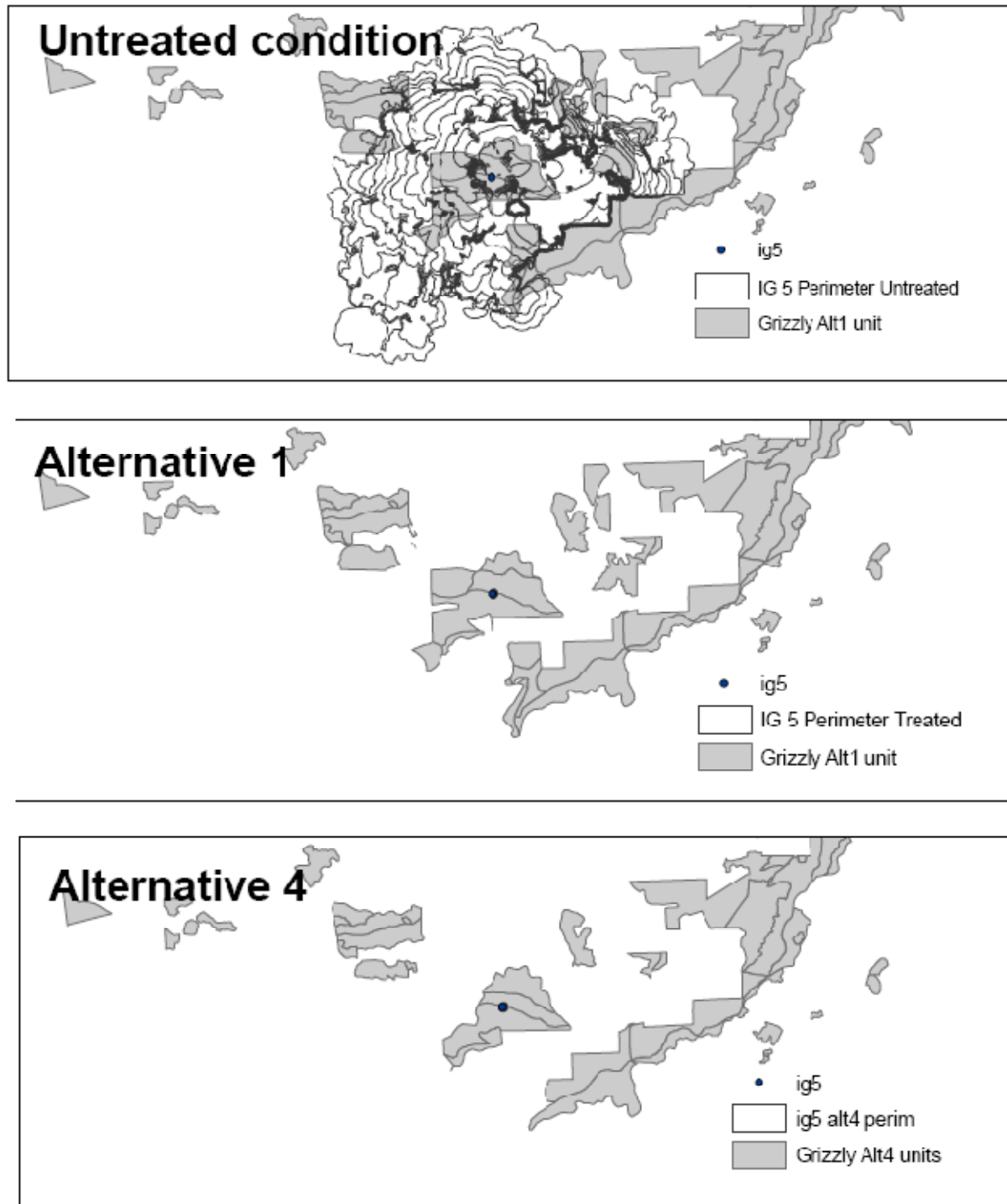


FIGURE 14 FARSITE MODELED 24 HOUR FIRE PERIMETER GROWTH COMPARISON FOR IGNITION POINT 5

TABLE 10 PREDICTED EFFECTS TO FOREST VEGETATION WITH EACH ALTERNATIVE BASED ON STAND EXAMS, MARKING TALLIES, AND CRUISE TREE DATA

Item	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Stand Vigor, Stand Density Index, and Risk of Mortality Within Thinning Units	Majority of stands would remain above a Threshold of Concern based on stand density indexes for pines and oak indicating increased risk of mortality from insect attack and reduced vigor from heavy competition among trees for limited resources.	Majority of stands would be below a Threshold of Concern for pines and oak based on stand density indexes for the short-term, increasing stand vigor and reducing risk of insect and disease mortality.	Same as Alternative 1.	Majority of treated stands would be below the Threshold of Concern for pines and oak based on stand density indexes. Competition for resources in 820 acres not thinned would remain high. These stands would remain above the threshold of concern based on stand density index.	Majority of stands would remain above a Threshold of Concern based on stand density indexes for pines and oak indicating increased risk of mortality from insect attack and reduced vigor from heavy competition among trees for limited resources.	Majority of treated stands would be below the Threshold of Concern for pines and oak based on stand density indexes. Competition for resources in 434 acres not thinned would remain high. These stands would remain above the threshold of concern based on stand density index.
Ability to Promote Species Composition of Shade Intolerant Pines and Oak in Treated Stands	No Change	Increased	Increased	Increased in Treated Areas, No change in 820 acres	No Change	Increased in Treated Areas, No change in 434 acres
Expected Effectiveness on Controlling Brush Re-growth in Plantations	None	>10 years	<5 years	>10 years	>10 years	>10 years
Canopy Cover Post Treatment Would Meet 2004 SNFPA Standards and Guidelines	Yes	Yes	Yes	Yes	Yes	Yes
Approximate Number of Trees per Acre Removed between 20 and 30 inches	0	3.9	3.9	1.5	0	1.5
Approximate Number of Trees per Acre Removed Greater Than 9 inches	0	30.3	30.3	22.5	14	22.5
Approximate Number of Trees per Acre Removed Less Than 9 inches	0	75	75	75	75	75
Estimated Average Basal Area Removal per Acre in Trees Greater than 9 inches	0	54 ft <sup>2</sup>	54 ft <sup>2</sup>	27 ft <sup>2</sup>	11 ft <sup>2</sup>	27 ft <sup>2</sup>

TABLE 11 HIGHEST PREDICTED RISK FOR CUMULATIVE WATERSHED EFFECTS (CWE) WITH EACH ALTERNATIVE

Watershed	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Lower Long Canyon	Low	Low	Low	Low	Low	Low
Middle Long Canyon	Low	Low	Low	Low	Low	Low
Lower Rubicon River	Low	Low	Low	Low	Low	Low
Wallace Canyon	Low	Moderate	Moderate	Moderate	Moderate	Moderate
Big Grizzly Canyon	Moderate	High	High	High	High	High
Rubicon River-Pigeon Roost	Low	Low	Low	Low	Low	Low
Rubicon River-Leonardi Spring	Low	Moderate	Moderate	Moderate	Moderate	Moderate
South Fork Long Canyon Creek	Low	Low	Low	Low	Low	Low
Rubicon River-Stony Creek	Low	Low	Low	Low	Low	Low
Rubicon River-Ellicott Bridge	Low	Low	Low	Low	Low	Low

TABLE 12 PREDICTED EFFECTS FROM HERBICIDE USE WITH EACH ALTERNATIVE

Item	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Risk of Negative Impacts to Human Health and Safety from Herbicide Use Proposed	None	Low except for Sensitive Individuals	None	Low except for Sensitive Individuals	Low except for Sensitive Individuals	Low except for Sensitive Individuals
Risk of Negative Impacts to Terrestrial Wildlife from Herbicide Use Proposed	None	Low	None	Low	Low	Low
Risk of Negative Impacts to Aquatic Wildlife Species from Herbicide Use Proposed	None	Low	None	Low	Low	Low

TABLE 13 PREDICTED EFFECTS TO PLANTS AND WILDLIFE FROM COMMERCIAL AND NON-COMMERCIAL HARVEST, TRACTOR PILING, BRUSH CUTTING, MASTICATION, AND PRESCRIBED FIRE

Measure	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Sensitive Plants Potentially Affected by Project Activities	No Direct Effects. Loss of individuals and habitat possible in event of a large wildfire.	May impact individual plants or habitat but would not lead to a trend towards listing for <i>Cypripedium montanum</i> , <i>Lewisia serrata</i> , and <i>Phacelia stebbinsii</i> Same as Alternative 1		Impacts may be slightly reduced from Alternative 1		
Impacts from Project Activities on Potential Spread of Noxious Weeds	No Direct Effects, potential increase with wildfire suppression in event of a large wildfire	There is a potential for noxious weeds to be introduced and spread as a result of project activities. With glyphosate treatment, Scotch broom is not likely to expand due to project activities and the known occurrences may be reduced in size.	Potential for introduction and spread is the same as Alternative 1. Benefits of reduced scotch broom occurrences would on be possible.	Potential for introduction and spread would be reduced from Alternative 1 due to reduced project activity acres.	Potential for introduction and spread may be reduced from Alternative 1 through maintenance of higher canopy cover.	Potential for introduction and spread would be reduced from Alternative 1 due to reduced project activity acres.
Foothill Yellow-Legged Frog Habitat Potentially Affected by Project Activities	Loss of individuals and habitat possible in event of a large wildfire.	Up to 10 miles of perennial and intermittent streams				
Acres of California Red-Legged Frog Habitat Potentially Affected by Project Activities	Loss of individuals and habitat possible in event of a large wildfire.	0	0	0	0	0
Acres of Western Pond Turtle Habitat Potentially Affected by Project Activities	Loss of individuals and habitat possible in event of a large wildfire.	135	133	93	135	92

Impacts to Foothill Yellow-Legged and western pond turtle

Would not affect

May impact individuals, but is not likely to

Chapter 2 – Proposed Action, Alternative Description and Comparison

Measure		Alternative 2 No Action	Alternative 1 Proposed Action		Alternative 3	Alternative 4		Alternative 5 Non Commercial Alternative	Modified Alternative 1	
Acres of California Spotted Owl Habitat Affected	Nesting and Foraging Habitat	0	3,704		3,704	2,916		3,704	3,643	
Acres of California Spotted Owl Home Range Core Area (HRCA) Affected	HRCA Acres Proposed for Treatment	0	2,966		2,966	2,256		2,966	2,261	
	Nesting and Foraging Habitat	0	2,614		2,614	1,399		2,614	1,817	
	Nesting Potentially Reduced to Foraging Habitat	0	1,215		1,215	1,075		1,215	1,079	
	Foraging Habitat Potentially Reduced to Low Quality Foraging Habitat	0	191		191	188		191	188	
Percent of Each California Spotted Owl Home Range Core Area of suitable Nesting and Foraging Habitat Affected by Thinning and Improvement Treatments		0	HRCA	Percent Treated	Same as Alternative 1	HRCA	Percent Treated	Same as Alternative 1	HRCA	Percent Treated
			PLA0009	3		PLA0009	3		PLA0009	3
			PLA0010	27		PLA0010	21		PLA0010	22
			PLA0011	13		PLA0011	10		PLA0011	10
			PLA0012	31		PLA0012	23		PLA0012	29
			PLA0036	2		PLA0016	<1		PLA0016	2
			PLA0036NP	11		PLA0036NP	10		PLA0036NP	10
			PLA0038	7		PLA0038	0		PLA0038	0
			PLA0039	11		PLA0039	1		PLA0039	1

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Measure	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Number of Territories with less than 370 acres of Unaffected Nesting Habitat Post Project	0	3 (PLA0040, PLA0043, PLA0109)	Same as Alternative 1	1 (PLA0043)	Same as Alternative 1	1 (PLA0043)
Number of Additional Territories with Greater than 50 acres of Nesting Habitat Affected	0	3 (PLA0010, PLA0067, PLA0080)	Same as Alternative 1	2 (PLA0010 and PLA0080)	Same as Alternative 1	2 (PLA0010 and PLA0080)

**Comparison of Impacts to California Spotted Owl:** Under Alternative 2 existing suitable spotted owl habitat would not directly change. However, Alternative 2 has the largest predicted area of high severity fire effects which would have the greatest effect on owl habitat in the event of a future wildfire. With Alternatives 1, 3, 4, 5, and Modified Alternative 1, the direct, indirect, and cumulative effects are not expected to result in a trend toward Federal listing, as this project affects only a small portion of the species range and considering available data on the status of the California spotted owl. Because of the extent of treatment in eight HRCAs with Alternatives 1, 3, 5, and Modified Alternative 1, and six HRCAs with Alternative 4 there is the potential for short-term effects on occupancy and reproduction. This may result in a short-term reduction in the calculated lambda (population growth rate) within the Eldorado Density Study Area. Activities may result in some spotted owls shifting their territories; however, it is not expected that any alternative would result in a reduction in overall owl populations in the area. With Alternative 4 disturbance effects are anticipated to be similar to Alternative 1, although there would be fewer acres of mechanical harvest resulting in fewer disturbances in some owl territories and decreased impacts on some HRCA habitat. The difference in effects with Alternative 5 when compared to Alternative 1 would primarily be in retention of slightly more



## Chapter 2 – Proposed Action, Alternative Description and Comparison

Measure		Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Acres of Pacific Fisher Habitat Affected	Suitable	0	3,808	3,805	3,060	3,808	3,483
	Denning/ Resting	0	23	23	8	23	23
<p><b>Comparison of Impacts to Pacific Fisher:</b> It is not expected that fisher currently occur within the project area as no known denning or resting sites have been identified. With Alternative 2 there would be no direct effects to the Pacific fisher or its habitat, but habitat is not expected to increase as quickly as in Alternative 1. Alternative 2 has the largest predicted area of high severity fire effects which would have the greatest effect on Pacific fisher habitat in the event of a future wildfire. With implementation of Alternative 1, 3, 4, 5 or Modified Alternative 1, if fisher were in the area, individuals may be temporarily displaced; however the short duration of the project should minimize any disturbance that would result in permanent displacement. Alternatives 1, 3, 4, 5 and Modified Alternative 1, would have similar impacts to fisher habitat. Short-term and immediate impacts for all alternatives except Alternative 2 are mostly negative. Alternative 1 would have the greatest negative short-term and cumulative impacts through acres of reduced foraging and denning quality, delayed denning habitat increase and the most fragmentation of old forest emphasis habitat, however Alternative 1 would increase habitat the most over the very long-term. Alternative would be remove 10% of denning habitat in the project area through a reduction in canopy cover and downed wood within treatment units. Foraging habitat quality may be degraded temporarily, but would return or increase in quality after 5-10 years. Suitable habitat would be maintained within the project area and may actually increase in the long term as a result of treatments. Indirect effects would result in the faster proliferation of future fisher foraging and denning habitat in the long-term. Alternative 3, 4, 5 and Modified Alternative 1 would decrease these immediate and short-term impacts to foraging habitat With Alternative 3 faster recovery of habitat is expected from quicker brush re-growth without the use of herbicide as a follow-up treatment in 254 acres of identified habitat. Alternative 4 would slightly reduce the impact of the proposed treatment on fisher habitat as compared with Alternative 1 as habitat alteration would be reduced by not treating 702 acres with thinning from below treatments as well as 64 acres of prescribed burning including 15 acres of denning habitat. Alternative 5 would result in reduced alteration of the existing stand conditions by retaining more mid-story structure, and therefore is likely to contribute less to the fragmentation of fisher habitat within the project area. Alternative 4 would have the least amount of acres negatively impact to denning habitat and old forest emphasis habitat; while alternative 5 would have the least qualitative negative impacts. Modified Alternative 1 would slightly reduce the impact of the proposed treatments on fisher habitat as compared with Alternative 1 by not treating 325 acres of suitable habitat. Cumulatively, Modified Alternative 1 impacts a similar percentage of the landscape as the other action alternatives (Alt. 4 -29%; Alt.1 -31%) and is probably most comparable to Alternative 4 in its qualitative impacts to species on the landscape. As a result of the retention of denning habitat and forest emphasis habitat, Alternative 4 may be slightly more beneficial to fisher in the short-term, but in the extended long-term (&gt;30years) Modified Alternative 1 may have greater benefits.</p>							
Acres of American Marten Habitat Affected	Suitable	0	2,149	2,143	1,801	2,149	2,012
	Denning/ Resting	0	40	40	40	40	40
<p><b>Comparison of Impacts to American Marten:</b> With Alternative 2 there would be no direct effects to the American marten or its habitat. Suitable habitat would be maintained and habitat should increase within the project area in the long-term. Alternative 2 has the largest predicted area of high severity fire effects which would have the greatest effect on American marten habitat in the event of a future wildfire. Alternatives 1, 3, 4, 5 and Modified Alternative 1, would have similar impacts to marten habitat. Alternatives 1, 3, 4, 5 or Modified Alternative 1, may affect marten individuals and habitat, but the impacts are not likely to result in a trend towards federal listing. Short-term and immediate impacts for all alternatives except Alternative 2 are mostly negative. Alternative 1 would have the most negative short-term and cumulative impacts through acres of reduced foraging quality. Alternative 3, 4, 5, and Modified Alternative 1, would decrease these immediate and short-term impacts to foraging habitat, however Alternative 1 would increase habitat the most over the very long-term. Suitable habitat would be maintained within the project area and is expected to increase in the long term as a result of treatments. Foraging habitat quality may be degraded temporarily, but would return or increase in quality after 5-10 years. Retention of no harvest riparian corridors through units would maintain patches of higher quality habitat within treatment units. In the short-term, immediate cumulative impact of the proposed treatment on marten foraging habitat would be reduced with Alternative 3 as a result of brush re-growth expected without follow-up treatment of herbicide. In the short-term, Alternative 4 would slightly reduce</p>							

## Chapter 2 – Proposed Action, Alternative Description and Comparison

Measure		Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
the cumulative impact of the proposed treatment on marten habitat as compared with Alternative 1 by not treating 283 acres of suitable habitat with thinning from below as well as 64 acres of prescribed burning. Alternative 5 would result in less alternation of the existing stand condition compared to Alternative 1 and therefore would contribute less to the fragmentation of marten habitat within the project area. Modified Alternative 1 would slightly reduce the cumulative impact of the proposed treatment on marten habitat as compared with Alternative 1 by not treating 131 acres of suitable habitat. Cumulatively, modified alternative 1 impacts a similar percentage of the landscape as the other action alternatives (Alt. 4 -38%; Alt.1 -41%) and is probably most comparable to Alternative 4 in its qualitative impacts to species on the landscape. Alternative 4 may have slightly less short-term impacts, but in the extended long-term (>30years) Modified Alternative 1 may have greater benefits.							
Acres of Pallid Bat and Townsend's Big-eared bat Habitat Affected	Potential	0	5,662	5,639	4,754	5,662	4,917
	Preferred	0	402	402	326	402	372
<p><b>Comparison of Impacts to Pallid Bat and Townsend's Big-eared bat:</b> The No Action Alternative would not result in direct effects to the pallid bat, Townsend's big-eared bat, or their habitat. Foraging conditions would continue to degrade, however, as most bats prefer open habitats for foraging. Alternative 2 has the largest predicted area of high severity fire effects which would have the greatest effect on bat habitat in the event of a future wildfire. Alternatives 1, 3, 4, 5, and Modified Alternative 1 would have similar impacts to bat habitat. Short-term and immediate impacts for all alternatives except Alternative 2 have both positive and negative impacts. Alternatives 1, 3, 4, 5 or Modified Alternative 1, may affect individuals or habitat, but are not likely to result in a trend toward federal listing or loss of species viability for the pallid bat and Townsend's big-eared bat. Alternative 1 would have the most negative short-term and cumulative impacts through acres of reduced foraging quality. Alternative 1 would also increase habitat the most over the very long-term. Activities may result in disturbance or temporary displacement of bats using, however direct mortality or long-term displacement of sensitive bat species is not expected. The project would not remove preferred roosting and maternity sites (mines, caves, and old buildings) and there would be minimal, if any, losses of mature hardwoods or snags. Retention of riparian corridors through units would maintain patches of higher quality habitat within treatment units. The project would reduce ground level vegetation which may improve foraging opportunities. A decrease in the quality of foraging habitat would occur in the short-term and would most likely rebound in the long-term. The project reduces the risk of a stand-replacing wildfire and the resulting removal of bat roosting and foraging habitat. Alternative 3, 4, 5, and Modified Alternative 1, would decrease these immediate and short-term impacts to foraging habitat. In the short-term, immediate cumulative impact of the proposed treatment on foraging habitat would be reduced with Alternative 3, compared to Alternative 1 as a result of brush re-growth expected without follow-up treatment of herbicide. Alternative 4 would have the least negative impact to bat foraging habitat by reducing the amount of acres impacted by treatment. With Alternative 5 the amount of future snags available as potential bat habitat may be higher. In the short-term, Modified Alternative 1 would slightly reduce the cumulative impact of the proposed treatment on Pallid and Townsend's big-eared bat habitat as compared with Alternative 1 by not treating 535 acres of suitable habitat. Cumulatively, Modified Alternative 1 impacts a similar percentage of the landscape as the other action alternatives (Alt. 4 -32%; Alt.1 -35%) and is probably most comparable to Alternative 4 in its qualitative impacts to species on the landscape.</p>							

TABLE 14 PREDICTED HARVEST AND REVENUE FROM HARVEST OF COMMERCIAL SIZE MATERIAL AND COST TO FULLY IMPLEMENT EACH ALTERNATIVE<sup>5</sup>

Item	Alternative 2 No Action	Alternative 1 Proposed Action	Alternative 3	Alternative 4	Alternative 5 Non Commercial Alternative	Modified Alternative 1
Value of Commercial Sized Material Removed Through Thinning <sup>6</sup>	\$0	\$630,597	\$630,597	-\$81,735	\$0	-\$176,990
Volume of Trees Removed Greater than 9" dbh in Board Feet	0	15.4 million	15.4 million	8.7 million	1.1 million	9.6 million
Cost of Biomass Removal During Commercial Thinning	\$0	\$375,060	\$375,060	\$297,980	\$0	\$330,222
Cost of Biomass Removal as a Separate Operation	\$0	\$0	\$0	\$0	\$2,956,590	\$0
Maximum Cost of Tractor Piling and Brush Cutting <sup>7</sup>	\$0	\$1,065,000	\$1,065,000	\$820,500	Included in biomass removal	\$923,400
Cost to Burn Piles	\$0	\$177,500	\$177,500	\$136,750	\$177,500	\$153,900
Cost of Planting in Stand Improvement Gaps	\$0	\$25,000	\$25,000	\$25,000	\$0	\$25,000
Cost of Hand Grubbing	\$0	\$0	\$35,000	\$0	\$0	\$0
Cost of Proposed Mastication in Plantations	\$0	\$760,000	\$1,245,000	\$760,000	\$760,000	\$760,000
Cost of Proposed Herbicide Use	\$0	\$300,000	\$0	\$300,000	\$275,000	\$300,000
Cost to Complete Proposed Prescribed Burning <sup>8</sup>	\$0	\$832,500	\$832,500	\$602,500	\$1,055,000	\$688,250
Cost to Accomplish Road Work Needed to Bring Roads to a Maintainable Condition	\$0	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000

5 See table 2-5 for acres of proposed treatment for each alternative.

6 Value of material removed includes cost for stump treatment with Sporax and cost of road work needed.

7 Because not all acres that are proposed for thinning or stand improvement would have tractor piling or brush cutting this cost would be reduced. However, until implementation it is not possible to accurately estimate how many acres would not need tractor piled or brush cutting.

8 It is likely that not all the proposed prescribe burning would be accomplished with this project due to burn restrictions and work capacity. Higher priority areas for burning would be accomplished first, while areas with less maintenance need would be less of a priority for burning. Future projects are expected to prescribe maintenance treatments of these stands if prescribe burning is not fully implemented, however, the need for maintenance and the types of treatment cannot be accurately estimated at this time.